ภาคผนวก ค

ใบรับรองผลการตรวจวิเคราะห์ผลกระทบสิ่งแวดล้อม

Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425435
Date Received :Mar 28, 2024
Date Reported :Apr 06, 2024
Report Number :2926725-1

Sample Number 2425435-1
Sample Description Emission from Stationary Source
Location HRSGs 1 (GPS 47P 0728137, 1405521)
Measurement Date Mar 27, 2024

Stack Description

Ambient Temperature	32	°C	Diameter	3.30	m	Oxygen	13.62	%
Ambient Pressure	757	mmHg	Shape	Circle		Carbon dioxide	4.35	%
Type of Process	Combustion		Stack Temperature	141	°C	Gas Velocity	18.78	m/s
Type of Fuel	Natural Gas		Moisture	10.11	%	Flow Rate	372458	Nm3/hr

Run No.	Sampling Time	Oxygen (%)	Carbon Dioxide (%)	Oxides of Nitrogen (ppm) at Actual O_2	Oxides of Nitrogen (ppm) at 7% O_2	Sulfur Dioxide (ppm) at Actual O_2	Sulfur Dioxide (ppm) at 7% O_2
1	02:35 PM - 02:55 PM	13.62	4.37	10.33	19.72	0.09	0.17
2	02:56 PM - 03:16 PM	13.62	4.36	9.76	18.63	0.07	0.13
3	03:17 PM - 03:37 PM	13.62	4.35	9.78	18.67	0.07	0.13
Average (ppm)		13.62	4.36	9.96	19.01	0.08	0.15
Guideline[1] (ppm)				-	26.58	-	1.66
Guideline[2] (ppm)				-	120	-	20
Guideline[3] (ppm)				-	120	-	20
Result (mg/Nm^3)				18.74	35.76	0.20	0.38
Emission Rate at Actual O_2 (g/s)				1.9384		0.0206	
Guideline[1] (g/s)				3.000		0.255	
Method				US EPA Method 7E		US EPA Method 6C	

Sampled By : Sathapron Thakarw

Guideline :
[1] Environmental Impact Assessment Report of Global Power Synergy Public Company Limited (CUP 4)
[2]Notification of the Ministry of Industry on determining pollutant contents in air emitted from electric power generation, transmission and distribution plant, 2004 (B.E. 2547), dated September, 2004 (B.E. 2547).
[3]Notification of the Ministry of Natural Resources and Environment, 2023 (B.E. 2566) on Emission Standard from Power Plants.

Technical Management
Wichan Choonharat
Manager
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Approved by
Sarayuth Jittranont
Assistant General Manager
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The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any from without written consent from the Laboratory. ALS Laboratory Group(Thailand) strongly recommends that this report is not reproduced except in full.

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ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425439
Date Received : Mar 27, 2024
Date Reported : Apr 08, 2024
Report Number: 2926722-1

Sample Number 2425439-1
Sampled Date Mar 27, 2024
Sample Description Emission from Stationary Source
Location HRSGs 1 (GPS 47P 0728137, 1405521)
Date Analysis Commenced Mar 28, 2024
Condition of Sample Extracted into one filter paper placed in plastic petri dish, one plastic bottle and one amber plastic bottle, refrigerated

Stack Description

Ambient Pressure	757	mmHg	Diameter	3.30	m	Oxygen	13.6	%
Ambient Temperature	32.0	°C	Shape	Circle		Carbon Dioxide	4.4	%
Type of Process	Combustion		Stack Temperature	141	°C	Gas Velocity	18.8	m/s
Type of Fuel	Natural Gas		Moisture	10.08	%	Flow Rate (Actual O2)	372286	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result at 7 %O_2	Result at 13.6 %O_2	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing										
Total Suspended Particulate	02:40 PM - 03:29 PM	mg/m3	-	0.5	<0.5	<0.5	60	7,100	United States Environmental Protection Agency, EPA Method 5	Rayong

Guideline :
Guideline (1) : Notification of the Ministry of Industry on determining pollutant contents in air emitted from electric power generation, transmission and distribution plant, 2004 (B.E. 2547), dated September, 2004 (B.E. 2547).
: Notification of the Ministry of Natural Resources and Environment, 2023 (B.E. 2566) on Emission Standard from Power Plants.

Guideline (2) : Environmental Impact Assessment Report of Global Power Synergy Public Company Limited. (CUP 4)

Technical Management
Thanita Kulsuriwong
Scientist (4)
ทะเบียนเลขที่ ว-323-ง-9447

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ง-9442

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ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425439
Date Received : Mar 27, 2024
Date Reported : Apr 08, 2024
Report Number: 2926722-1

Sample Number 2425439-1
Sampled Date Mar 27, 2024
Sample Description Emission from Stationary Source
Location HRSGs 1 (GPS 47P 0728137, 1405521)
Date Analysis Commenced Mar 28, 2024
Condition of Sample Extracted into one filter paper placed in plastic petri dish, one plastic bottle and one amber plastic bottle, refrigerated

Stack Description

Ambient Pressure	757	mmHg	Diameter	3.30	m	Oxygen	13.6	%
Ambient Temperature	32.0	°C	Shape	Circle		Carbon Dioxide	4.4	%
Type of Process	Combustion		Stack Temperature	141	°C	Gas Velocity	18.8	m/s
Type of Fuel	Natural Gas		Moisture	10.08	%	Flow Rate (Actual O2)	372286	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result Emission Rate	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Total Suspended Particulate *	02:40 PM - 03:28 PM	g/s	-	-	<0.052	-	0.416	Calculated	Rayong

Guideline :
Guideline (1) : Notification of the Ministry of Industry on determining pollutant contents in air emitted from electric power generation, transmission and distribution plant, 2004 (B.E. 2547), dated September, 2004 (B.E. 2547).
: Notification of the Ministry of Natural Resources and Environment, 2023 (B.E. 2566) on Emission Standard from Power Plants.

Guideline (2) : Environmental Impact Assessment Report of Global Power Synergy Public Company Limited. (CUP 4)

Sampled By : Santi Chaichana

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425437
Date Received : Apr 01, 2024
Date Reported : Apr 05, 2024
Report Number: 2926767-1

Sample Description Air Quality
Location จุดประชุมสมาชาย
Parameter Nitrogen dioxide (ppm)
Measurement Date Mar 22, 2024 - Mar 29, 2024
Measurement by Chatchai Sukpia

Time	2425437-1 Mar 22, 2024	2425437-2 Mar 23, 2024	2425437-3 Mar 24, 2024	2425437-4 Mar 25, 2024	2425437-5 Mar 26, 2024	2425437-6 Mar 27, 2024	2425437-7 Mar 28, 2024
10:00 AM - 11:00 AM	0.014	0.003	0.005	0.011	0.010	0.008	0.005
11:00 AM - 12:00 PM	0.011	0.011	0.009	0.013	0.006	0.012	0.005
12:00 PM - 01:00 PM	0.008	0.011	0.015	0.008	0.004	0.007	0.003
01:00 PM - 02:00 PM	0.008	0.011	0.012	0.008	0.008	0.006	0.003
02:00 PM - 03:00 PM	0.004	0.008	0.009	0.009	0.004	0.006	0.004
03:00 PM - 04:00 PM	0.008	0.009	0.012	0.008	0.015	0.005	0.006
04:00 PM - 05:00 PM	0.005	0.017	0.012	0.009	0.008	0.005	0.004
05:00 PM - 06:00 PM	0.016	0.018	0.009	0.008	0.011	0.005	0.005
06:00 PM - 07:00 PM	0.015	0.010	0.018	0.017	0.017	0.002	0.006
07:00 PM - 08:00 PM	0.014	0.024	0.015	0.015	0.016	0.005	0.004
08:00 PM - 09:00 PM	0.016	0.018	0.012	0.019	0.017	0.004	0.005
09:00 PM - 10:00 PM	0.014	0.007	0.012	0.016	0.008	0.006	0.006
10:00 PM - 11:00 PM	0.016	0.008	0.010	0.015	0.007	0.003	0.007
11:00 PM - 12:00 AM	0.015	0.004	0.008	0.010	0.006	0.005	0.005
12:00 AM - 01:00 AM	0.019	0.004	0.004	0.008	0.012	0.003	0.006
01:00 AM - 02:00 AM	0.003	0.004	0.004	0.015	0.007	0.003	0.005
02:00 AM - 03:00 AM	0.013	0.006	0.004	0.008	0.004	0.003	0.005
03:00 AM - 04:00 AM	0.012	0.004	0.007	0.010	0.007	0.003	0.005
04:00 AM - 05:00 AM	0.005	0.004	0.003	0.008	0.006	0.003	0.005
05:00 AM - 06:00 AM	0.008	0.007	0.005	0.010	0.008	0.006	0.005
06:00 AM - 07:00 AM	0.005	0.010	0.011	0.007	0.007	0.002	0.004
07:00 AM - 08:00 AM	<0.001	0.010	0.019	0.009	0.008	0.002	0.005
08:00 AM - 09:00 AM	0.007	0.010	0.016	0.009	0.008	0.002	0.005
09:00 AM - 10:00 AM	0.012	0.008	0.006	0.008	0.009	0.002	0.009
Average	0.010	0.009	0.010	0.011	0.009	0.004	0.005
1hr - Maximum	0.019	0.024	0.019	0.019	0.017	0.012	0.009
Standard 1hr - Average	0.170	0.170	0.170	0.170	0.170	0.170	0.170

Standard : Notification of the National Environment Board No. 33, 2009 (B.E. 2552).
Reference Method : US EPAMethod Part 60 App. F (Chemiluminescence)

Approved by
Orawan Rakyong
Scientist (3)

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report may be reproduced in any form without written consent from the laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425437
Date Received : Apr 01, 2024
Date Reported : Apr 05, 2024
Report Number: 2958294-1

Sample Description Air Quality
Location มัสยิดบ้านแขว้ง
Parameter Nitrogen dioxide (ppm)
Measurement Date Mar 22, 2024 - Mar 29, 2024
Measurement by Chatchai Sukpia

Time	2425437-8 Mar 22, 2024	2425437-9 Mar 23, 2024	2425437-10 Mar 24, 2024	2425437-11 Mar 25, 2024	2425437-12 Mar 26, 2024	2425437-13 Mar 27, 2024	2425437-14 Mar 28, 2024
09:00 AM - 10:00 AM	0.003	0.003	0.003	0.003	0.004	0.009	0.004
10:00 AM - 11:00 AM	0.003	0.002	0.004	0.003	0.002	0.007	0.004
11:00 AM - 12:00 PM	0.003	0.002	0.003	0.003	0.002	0.005	0.004
12:00 PM - 01:00 PM	0.002	0.001	0.002	0.003	0.001	0.004	0.004
01:00 PM - 02:00 PM	0.002	0.001	0.002	0.003	0.001	0.004	0.004
02:00 PM - 03:00 PM	0.002	0.001	0.003	0.003	0.002	0.004	0.005
03:00 PM - 04:00 PM	0.002	0.002	0.004	0.003	0.003	0.003	0.007
04:00 PM - 05:00 PM	0.002	0.002	0.002	0.003	0.005	0.002	0.004
05:00 PM - 06:00 PM	0.001	0.001	0.002	0.002	0.002	0.002	0.005
06:00 PM - 07:00 PM	0.001	0.001	0.002	0.001	0.002	0.002	0.006
07:00 PM - 08:00 PM	0.001	0.001	0.001	0.001	0.002	0.004	0.005
08:00 PM - 09:00 PM	0.001	0.001	0.001	0.001	0.002	0.010	0.006
09:00 PM - 10:00 PM	0.001	0.001	0.001	0.001	0.001	0.003	0.004
10:00 PM - 11:00 PM	<0.001	0.001	0.001	0.001	<0.001	0.004	0.004
11:00 PM - 12:00 AM	<0.001	0.002	0.001	0.003	0.003	0.003	0.005
12:00 AM - 01:00 AM	<0.001	0.002	0.002	0.003	0.007	0.003	0.007
01:00 AM - 02:00 AM	0.003	0.004	0.012	0.008	0.010	0.004	0.012
02:00 AM - 03:00 AM	0.007	0.011	0.012	0.009	0.016	0.005	0.015
03:00 AM - 04:00 AM	0.008	0.009	0.016	0.007	0.019	0.005	0.020
04:00 AM - 05:00 AM	0.007	0.008	0.014	0.008	0.015	0.005	0.017
05:00 AM - 06:00 AM	0.006	0.008	0.012	0.006	0.019	0.006	0.015
06:00 AM - 07:00 AM	0.005	0.006	0.007	0.006	0.012	0.006	0.018
07:00 AM - 08:00 AM	0.004	0.005	0.004	0.006	0.011	0.005	0.012
08:00 AM - 09:00 AM	0.003	0.004	0.004	0.005	0.011	0.004	0.008
Average	0.003	0.003	0.005	0.004	0.006	0.004	0.008
1hr - Maximum	0.008	0.011	0.016	0.009	0.019	0.010	0.020
Standard 1hr - Average	0.170	0.170	0.170	0.170	0.170	0.170	0.170

Standard : Notification of the National Environment Board No. 33, 2009 (B.E. 2552).
Reference Method : US EPAMethod Part 50 App. F (Chemiluminescence)

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Approved by
Orawan Rakyong
Scientist (3)

Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425437
Date Received : Apr 01, 2024
Date Reported : Apr 05, 2024
Report Number: 2958297-1

Sample Description Air Quality
Location โรงเรียนบ้านหนำ
Parameter Nitrogen dioxide (ppm)
Measurement Date Mar 22, 2024 - Mar 29, 2024
Measurement by Chatchai Sukpia

Time	2425437-15 Mar 22, 2024	2425437-16 Mar 23, 2024	2425437-17 Mar 24, 2024	2425437-18 Mar 25, 2024	2425437-19 Mar 26, 2024	2425437-20 Mar 27, 2024	2425437-21 Mar 28, 2024
12:00 PM - 01:00 PM	0.027	0.004	0.001	0.002	0.003	0.001	0.005
01:00 PM - 02:00 PM	0.025	0.004	0.001	0.003	0.005	0.001	0.006
02:00 PM - 03:00 PM	0.006	0.005	0.001	0.002	0.002	0.001	0.007
03:00 PM - 04:00 PM	0.005	0.003	0.002	0.002	0.002	0.002	0.006
04:00 PM - 05:00 PM	0.007	0.008	0.002	0.002	0.003	0.002	0.038
05:00 PM - 06:00 PM	0.003	0.001	0.002	0.002	0.010	0.008	0.059
06:00 PM - 07:00 PM	0.004	0.001	0.002	0.002	0.025	0.012	0.049
07:00 PM - 08:00 PM	0.003	0.001	0.003	0.002	0.011	0.006	0.042
08:00 PM - 09:00 PM	0.003	0.001	0.001	0.002	0.005	0.006	0.012
09:00 PM - 10:00 PM	0.002	0.001	<0.001	0.001	0.003	0.006	0.010
10:00 PM - 11:00 PM	0.002	0.005	<0.001	0.001	0.002	0.004	0.008
11:00 PM - 12:00 AM	0.006	0.005	<0.001	0.001	0.002	0.006	0.005
12:00 AM - 01:00 AM	0.002	0.006	<0.001	0.001	0.002	0.002	0.004
01:00 AM - 02:00 AM	0.006	<0.001	<0.001	0.001	0.002	0.002	0.004
02:00 AM - 03:00 AM	0.004	0.001	<0.001	0.001	0.001	0.002	0.003
03:00 AM - 04:00 AM	0.003	<0.001	<0.001	0.001	0.002	0.002	0.003
04:00 AM - 05:00 AM	0.002	0.003	<0.001	0.001	0.003	0.003	0.005
05:00 AM - 06:00 AM	0.004	0.001	<0.001	<0.001	0.004	0.008	0.008
06:00 AM - 07:00 AM	0.003	<0.001	0.001	0.001	0.005	0.014	0.012
07:00 AM - 08:00 AM	0.001	0.001	0.002	0.005	0.004	0.014	0.007
08:00 AM - 09:00 AM	0.039	0.001	0.002	0.004	0.004	0.006	0.008
09:00 AM - 10:00 AM	0.011	0.001	0.002	0.002	0.005	0.008	0.007
10:00 AM - 11:00 AM	0.033	0.001	0.002	0.007	0.004	0.005	0.009
11:00 AM - 12:00 PM	0.007	0.002	0.002	0.003	0.003	0.005	0.007
Average	0.009	0.002	0.001	0.002	0.005	0.005	0.013
1hr - Maximum	0.039	0.008	0.003	0.007	0.025	0.014	0.059
Standard 1hr - Average	0.170	0.170	0.170	0.170	0.170	0.170	0.170

Standard : Notification of the National Environment Board No. 33, 2009 (B.E. 2552).
Reference Method : US EPAMethod Part 50 App. F (Chemiluminescence)

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Approved by
Orawan Rakyong
Scientist (3)

Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425437
Date Received : Apr 01, 2024
Date Reported : Apr 05, 2024
Report Number: 2958298-1

Sample Description Air Quality
Location โรงเรียนชุมชน
Parameter Nitrogen dioxide (ppm)
Measurement Date Mar 22, 2024 - Mar 29, 2024
Measurement by Chatchai Sukpia

Time	2425437-22 Mar 22, 2024	2425437-23 Mar 23, 2024	2425437-24 Mar 24, 2024	2425437-25 Mar 25, 2024	2425437-26 Mar 26, 2024	2425437-27 Mar 27, 2024	2425437-28 Mar 28, 2024
11:00 AM - 12:00 PM	0.004	0.004	0.004	0.014	0.010	0.002	0.009
12:00 PM - 01:00 PM	0.006	0.010	0.002	0.013	0.007	0.004	0.006
01:00 PM - 02:00 PM	0.030	0.006	0.002	0.005	0.003	0.002	0.005
02:00 PM - 03:00 PM	0.004	0.004	0.002	0.004	0.002	0.002	0.009
03:00 PM - 04:00 PM	0.010	0.003	<0.001	0.004	0.003	0.002	0.004
04:00 PM - 05:00 PM	0.011	0.005	0.002	0.003	0.003	0.003	0.004
05:00 PM - 06:00 PM	0.012	0.010	0.004	0.006	0.005	0.006	0.005
06:00 PM - 07:00 PM	0.008	0.013	0.008	0.011	0.002	0.005	0.004
07:00 PM - 08:00 PM	0.008	0.011	0.005	0.010	0.003	0.006	0.007
08:00 PM - 09:00 PM	0.018	0.012	0.004	0.006	0.002	0.004	0.005
09:00 PM - 10:00 PM	0.014	0.007	0.002	0.006	0.002	0.003	0.009
10:00 PM - 11:00 PM	0.020	0.007	0.002	0.011	0.001	0.001	0.013
11:00 PM - 12:00 AM	0.026	0.003	0.001	0.014	0.001	0.002	0.003
12:00 AM - 01:00 AM	0.013	0.003	0.002	0.008	0.001	0.004	0.008
01:00 AM - 02:00 AM	0.007	0.002	0.002	0.002	<0.001	0.004	0.004
02:00 AM - 03:00 AM	0.006	0.002	0.002	0.003	0.001	0.002	0.006
03:00 AM - 04:00 AM	0.004	0.002	0.002	0.003	0.002	0.004	0.002
04:00 AM - 05:00 AM	0.003	0.003	0.002	0.005	0.004	0.005	0.003
05:00 AM - 06:00 AM	0.006	0.004	0.003	0.011	0.007	0.010	0.017
06:00 AM - 07:00 AM	0.010	0.007	0.005	0.008	0.012	0.009	0.014
07:00 AM - 08:00 AM	0.002	0.008	0.003	0.008	0.009	0.007	0.008
08:00 AM - 09:00 AM	0.002	0.005	0.002	0.015	0.007	0.008	0.008
09:00 AM - 10:00 AM	0.003	0.006	0.002	0.011	0.016	0.004	0.008
10:00 AM - 11:00 AM	0.004	0.004	0.006	0.012	0.013	0.004	0.008
Average	0.010	0.006	0.003	0.008	0.005	0.004	0.007
1hr - Maximum	0.030	0.013	0.008	0.015	0.016	0.010	0.017
Standard 1hr - Average	0.170	0.170	0.170	0.170	0.170	0.170	0.170

Standard : Notification of the National Environment Board No. 33, 2009 (B.E. 2552).
Reference Method : US EPAMethod Part 50 App. F (Chemiluminescence)

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report may be reproduced in any form without written consent from the laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by
Orawan Rakyong
Scientist (3)

Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425470
Date Received : Apr 01, 2024
Date Reported : Apr 05, 2024
Report Number: 2926764-1

Sample Description Air Quality
Location โรงประชุมสิทธิบำรุง
Parameter Sulfur Dioxide (ppm)
Measurement Date Mar 22, 2024 - Mar 29, 2024
Measurement by Chatchai Sukpia

Time	2425470-1 Mar 22, 2024	2425470-2 Mar 23, 2024	2425470-3 Mar 24, 2024	2425470-4 Mar 25, 2024	2425470-5 Mar 26, 2024	2425470-6 Mar 27, 2024	2425470-7 Mar 28, 2024
10:00 AM - 11:00 AM	0.001	0.001	0.002	0.001	0.002	0.003	0.002
11:00 AM - 12:00 PM	0.001	0.002	0.002	0.002	0.002	0.002	0.002
12:00 PM - 01:00 PM	0.001	0.002	0.002	0.002	0.002	0.002	<0.001
01:00 PM - 02:00 PM	0.002	0.002	0.001	0.002	0.002	0.002	0.002
02:00 PM - 03:00 PM	0.002	0.002	0.001	0.002	0.003	0.002	0.002
03:00 PM - 04:00 PM	0.001	0.002	0.002	0.002	0.001	0.001	0.003
04:00 PM - 05:00 PM	0.002	0.001	0.001	0.003	0.001	0.001	0.001
05:00 PM - 06:00 PM	0.001	0.001	<0.001	0.002	0.001	0.002	0.002
06:00 PM - 07:00 PM	0.002	0.002	<0.001	0.001	0.002	0.001	0.001
07:00 PM - 08:00 PM	0.001	0.002	0.001	<0.001	0.001	0.002	<0.001
08:00 PM - 09:00 PM	<0.001	0.002	<0.001	<0.001	0.001	0.002	<0.001
09:00 PM - 10:00 PM	0.001	0.002	<0.001	<0.001	0.001	0.002	0.002
10:00 PM - 11:00 PM	0.001	0.002	<0.001	<0.001	<0.001	0.002	<0.001
11:00 PM - 12:00 AM	<0.001	0.001	<0.001	<0.001	<0.001	0.002	<0.001
12:00 AM - 01:00 AM	<0.001	0.001	<0.001	<0.001	<0.001	0.001	<0.001
01:00 AM - 02:00 AM	<0.001	0.001	0.001	<0.001	<0.001	0.001	0.001
02:00 AM - 03:00 AM	0.001	0.001	0.002	<0.001	<0.001	<0.001	0.001
03:00 AM - 04:00 AM	0.001	0.001	0.002	0.001	0.001	<0.001	0.001
04:00 AM - 05:00 AM	0.002	0.001	<0.001	0.002	0.002	<0.001	<0.001
05:00 AM - 06:00 AM	0.001	0.002	0.001	0.002	0.001	<0.001	0.002
06:00 AM - 07:00 AM	0.002	0.001	0.001	0.002	0.001	<0.001	0.002
07:00 AM - 08:00 AM	0.002	0.001	0.001	0.002	0.002	0.002	0.003
08:00 AM - 09:00 AM	0.002	0.001	0.001	0.002	0.002	0.002	0.001
09:00 AM - 10:00 AM	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Average	0.001	0.002	0.001	0.001	0.001	0.001	0.001
1hr - Maximum	0.002	0.002	0.002	0.003	0.003	0.003	0.003
Standard 1hr - Average	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Standard 24 hrs - Average	0.12	0.12	0.12	0.12	0.12	0.12	0.12

Standard : Notification of the National Environment Board No.10, 1995 (B.E.2538), No. 21, 2001 (B.E.2544) and No.24, 2004 (B.E.2547).
Reference Method : US EPA Method Part 53 and 58

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report may be reproduced in any form without written consent from the laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by
Orawan Rakyong
Scientist (3)

Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425470
Date Received : Apr 01, 2024
Date Reported : Apr 05, 2024
Report Number: 2958289-1

Sample Description Air Quality
Location บ้านท่ามะนาว
Parameter Sulfur Dioxide (ppm)
Measurement Date Mar 22, 2024 - Mar 29, 2024
Measurement by Chatchai Sukpia

Time	2425470-8 Mar 22, 2024	2425470-9 Mar 23, 2024	2425470-10 Mar 24, 2024	2425470-11 Mar 25, 2024	2425470-12 Mar 26, 2024	2425470-13 Mar 27, 2024	2425470-14 Mar 28, 2024
09:00 AM - 10:00 AM	0.002	0.003	0.003	0.002	0.002	0.002	0.003
10:00 AM - 11:00 AM	0.002	0.004	0.003	0.002	0.002	0.002	0.004
11:00 AM - 12:00 PM	0.002	0.004	0.003	0.002	0.002	0.002	0.005
12:00 PM - 01:00 PM	0.002	0.003	0.003	0.002	0.002	0.002	0.005
01:00 PM - 02:00 PM	0.002	0.003	0.003	0.002	0.002	0.002	0.004
02:00 PM - 03:00 PM	0.002	0.004	0.003	0.002	0.002	0.002	0.004
03:00 PM - 04:00 PM	0.002	0.004	0.003	0.002	0.002	0.002	0.003
04:00 PM - 05:00 PM	0.002	0.003	0.003	0.002	0.002	0.002	0.003
05:00 PM - 06:00 PM	0.002	0.003	0.002	0.002	0.002	0.002	0.003
06:00 PM - 07:00 PM	0.002	0.007	0.002	0.002	0.002	0.002	0.003
07:00 PM - 08:00 PM	0.002	0.005	0.002	0.002	0.002	0.002	0.003
08:00 PM - 09:00 PM	0.002	0.007	0.002	0.002	0.002	0.002	0.002
09:00 PM - 10:00 PM	0.002	0.005	0.002	0.002	0.002	0.002	0.002
10:00 PM - 11:00 PM	0.002	0.003	0.002	0.002	0.002	0.002	0.002
11:00 PM - 12:00 AM	0.002	0.003	0.002	0.001	0.002	0.002	0.003
12:00 AM - 01:00 AM	0.002	0.003	0.002	0.002	0.002	0.002	0.003
01:00 AM - 02:00 AM	0.002	0.003	0.002	0.002	0.002	0.002	0.002
02:00 AM - 03:00 AM	0.002	0.003	0.002	0.002	0.002	0.002	0.002
03:00 AM - 04:00 AM	0.002	0.003	0.002	0.001	0.002	0.002	0.002
04:00 AM - 05:00 AM	0.002	0.003	0.002	0.001	0.002	0.002	0.002
05:00 AM - 06:00 AM	0.002	0.003	0.002	0.002	0.002	0.002	0.001
06:00 AM - 07:00 AM	0.002	0.003	0.002	0.002	0.002	0.002	0.002
07:00 AM - 08:00 AM	0.002	0.002	0.002	0.002	0.002	0.002	0.002
08:00 AM - 09:00 AM	0.002	<0.001	0.002	0.002	0.002	0.003	0.002
Average	0.002	0.003	0.003	0.002	0.002	0.002	0.003
1hr - Maximum	0.002	0.007	0.003	0.002	0.002	0.003	0.005
Standard 1hr - Average	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Standard 24 hrs - Average	0.12	0.12	0.12	0.12	0.12	0.12	0.12

Standard : Notification of the National Environment Board No.10, 1995 (B.E.2538), No. 21, 2001 (B.E.2544) and No.24, 2004 (B.E.2547).
Reference Method : US EPA Method Part 53 and 58

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Approved by
Orawan Rakyong
Scientist (3)

Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425470
Date Received : Apr 01, 2024
Date Reported : Apr 05, 2024
Report Number: 2958291-1

Sample Description Air Quality
Location โรงเรียนหนองหว้า
Parameter Sulfur Dioxide (ppm)
Measurement Date Mar 22, 2024 - Mar 29, 2024
Measurement by Chatchai Sukpia

Time	2425470-15 Mar 22, 2024	2425470-16 Mar 23, 2024	2425470-17 Mar 24, 2024	2425470-18 Mar 25, 2024	2425470-19 Mar 26, 2024	2425470-20 Mar 27, 2024	2425470-21 Mar 28, 2024
12:00 PM - 01:00 PM	0.001	0.002	0.001	0.001	0.001	0.001	0.002
01:00 PM - 02:00 PM	0.001	0.002	0.001	0.002	0.001	0.001	0.002
02:00 PM - 03:00 PM	0.001	0.001	0.002	0.002	0.001	0.001	0.002
03:00 PM - 04:00 PM	0.001	0.002	0.001	0.002	0.001	0.001	0.002
04:00 PM - 05:00 PM	0.001	0.002	0.001	0.002	0.001	0.001	0.002
05:00 PM - 06:00 PM	0.001	0.002	0.002	0.001	0.001	0.002	0.001
06:00 PM - 07:00 PM	0.001	0.002	0.002	0.001	0.001	0.001	0.001
07:00 PM - 08:00 PM	0.001	0.001	0.002	0.001	0.001	0.001	0.002
08:00 PM - 09:00 PM	0.001	0.002	0.002	0.001	0.001	0.001	0.002
09:00 PM - 10:00 PM	0.002	0.002	0.002	0.002	0.001	0.001	0.001
10:00 PM - 11:00 PM	0.001	0.001	0.002	0.001	0.001	0.001	0.001
11:00 PM - 12:00 AM	0.001	0.002	0.001	0.002	0.001	0.002	0.001
12:00 AM - 01:00 AM	0.001	0.001	0.001	0.002	0.002	0.001	0.001
01:00 AM - 02:00 AM	0.001	0.001	0.001	0.002	0.001	0.001	0.002
02:00 AM - 03:00 AM	0.001	0.002	0.001	0.002	0.001	0.001	0.002
03:00 AM - 04:00 AM	0.001	0.001	0.001	0.001	0.001	0.001	0.002
04:00 AM - 05:00 AM	0.001	0.001	0.001	0.002	0.001	0.001	0.002
05:00 AM - 06:00 AM	0.002	0.002	0.001	0.001	0.001	0.001	0.002
06:00 AM - 07:00 AM	0.002	0.002	0.001	0.001	0.002	0.001	0.002
07:00 AM - 08:00 AM	0.002	0.002	0.001	0.001	0.001	0.001	0.002
08:00 AM - 09:00 AM	0.002	0.002	0.001	0.001	0.001	0.001	0.002
09:00 AM - 10:00 AM	0.002	0.002	0.002	0.001	0.001	0.001	0.001
10:00 AM - 11:00 AM	0.002	0.002	0.001	0.001	0.001	0.002	0.001
11:00 AM - 12:00 PM	0.002	0.002	0.002	0.001	0.001	0.003	0.002
Average	0.001	0.002	0.001	0.001	0.001	0.001	0.002
1hr - Maximum	0.002	0.002	0.002	0.002	0.002	0.003	0.002
Standard 1hr - Average	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Standard 24 hrs - Average	0.12	0.12	0.12	0.12	0.12	0.12	0.12

Standard : Notification of the National Environment Board No.10, 1995 (B.E.2538), No. 21, 2001 (B.E.2544) and No.24, 2004 (B.E.2547).
Reference Method : US EPA Method Part 53 and 58

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Approved by
Orawan Rakyong
Scientist (3)

Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425470
Date Received : Apr 01, 2024
Date Reported : Apr 05, 2024
Report Number: 2958293-1

Sample Description Air Quality
Location โรงเรียนบ้านคลอง
Parameter Sulfur Dioxide (ppm)
Measurement Date Mar 22, 2024 - Mar 29, 2024
Measurement by Chatchai Sukpia

Time	2425470-22 Mar 22, 2024	2425470-23 Mar 23, 2024	2425470-24 Mar 24, 2024	2425470-25 Mar 25, 2024	2425470-26 Mar 26, 2024	2425470-27 Mar 27, 2024	2425470-28 Mar 28, 2024
11:00 AM - 12:00 PM	0.013	0.003	0.004	0.005	0.007	0.004	0.003
12:00 PM - 01:00 PM	0.011	0.005	0.003	0.007	0.007	0.003	0.005
01:00 PM - 02:00 PM	0.007	0.004	0.006	0.009	0.008	0.003	0.006
02:00 PM - 03:00 PM	0.007	0.004	0.005	0.006	0.008	0.006	0.007
03:00 PM - 04:00 PM	0.006	0.004	0.004	0.004	0.007	0.005	0.004
04:00 PM - 05:00 PM	0.007	0.003	0.003	0.004	0.005	0.006	0.003
05:00 PM - 06:00 PM	0.007	0.004	0.004	0.002	0.006	0.003	0.005
06:00 PM - 07:00 PM	0.004	0.005	0.005	<0.001	0.004	0.003	0.006
07:00 PM - 08:00 PM	0.002	0.004	0.005	0.009	0.003	0.004	0.004
08:00 PM - 09:00 PM	0.002	0.004	0.007	0.003	0.003	0.005	0.004
09:00 PM - 10:00 PM	0.011	0.004	0.004	0.004	0.003	0.005	0.006
10:00 PM - 11:00 PM	0.009	0.004	0.004	0.004	0.005	0.006	0.005
11:00 PM - 12:00 AM	0.015	0.005	0.003	0.003	0.007	0.003	0.004
12:00 AM - 01:00 AM	0.016	0.006	0.006	0.004	0.006	0.003	0.007
01:00 AM - 02:00 AM	0.007	0.004	0.005	0.005	0.002	0.003	0.006
02:00 AM - 03:00 AM	0.007	0.004	0.006	0.005	0.004	0.004	0.004
03:00 AM - 04:00 AM	0.008	0.006	0.005	0.006	0.004	0.004	0.004
04:00 AM - 05:00 AM	0.010	0.003	0.006	0.004	0.005	0.003	0.003
05:00 AM - 06:00 AM	0.005	0.004	0.006	0.003	0.007	0.003	0.004
06:00 AM - 07:00 AM	0.004	0.002	0.004	0.006	0.003	0.006	0.004
07:00 AM - 08:00 AM	0.002	0.003	0.004	0.006	0.005	0.005	0.004
08:00 AM - 09:00 AM	0.003	0.005	0.003	0.004	0.003	0.004	0.004
09:00 AM - 10:00 AM	0.004	0.004	0.003	0.005	0.002	0.003	0.004
10:00 AM - 11:00 AM	0.005	0.004	0.002	0.006	0.003	0.004	0.004
Average	0.007	0.004	0.004	0.005	0.005	0.004	0.005
1hr - Maximum	0.016	0.006	0.007	0.009	0.008	0.006	0.007
Standard 1hr - Average	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Standard 24 hrs - Average	0.12	0.12	0.12	0.12	0.12	0.12	0.12

Standard : Notification of the National Environment Board No.10, 1995 (B.E.2538), No. 21, 2001 (B.E.2544) and No.24, 2004 (B.E.2547).
Reference Method : US EPA Method Part 53 and 58

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report may be reproduced in any form without written consent from the laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by
Orawan Rakyong
Scientist (3)

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425471
Date Received : Apr 01, 2024
Date Reported : Apr 05, 2024
Report Number: 2926761-1

Sample Description Air Quality
Location โรงเรียนบ้านดงยาง
Date Analysis Commenced Apr 02, 2024
Condition of Sample Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one quartz filter paper (8x10 inch) placed in plastic bag

Sample Number	Sampled Date	Total Suspended Particulate (mg/m3)	Particulate Matter (PM-10) (mg/m3)	Barometric Pressure (mm Hg)	Atmospheric Temperature (°C)
2425471-1	Mar 22 - Mar 23, 2024	0.070	0.032	758	30
2425471-2	Mar 23 - Mar 24, 2024	0.035	0.022	758	28
2425471-3	Mar 24 - Mar 25, 2024	0.040	0.023	758	30
2425471-4	Mar 25 - Mar 26, 2024	0.033	0.017	758	31
2425471-5	Mar 26 - Mar 27, 2024	0.043	0.025	758	31
2425471-6	Mar 27 - Mar 28, 2024	0.035	0.018	758	28
2425471-7	Mar 28 - Mar 29, 2024	0.038	0.024	758	30
Guideline		0.33	0.12	-	-

Reference Method
Total Suspended Particulate : US EPA 40 CFR Part 50 Appendix B
Particulate Metter (PM-10) : US EPA 40 CFR Part 50 Appendix J
Guideline : Notification of the National Environmental Board. No.24, 2004 (B.E.2547) dated September 22, 2004
Sampled By : Chatchai Sukpia

Remark :
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Approved by
Thanita Kulsuriwong
Scientist (4)

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report may be reproduced in any form without written consent from the laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425471
Date Received : Apr 01, 2024
Date Reported : Apr 05, 2024
Report Number: 2926761-2

Sample Description Air Quality
Location บ้านสักหมอนาง
Date Analysis Commenced Apr 02, 2024
Condition of Sample Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one quartz filter paper (8x10 inch) placed in plastic bag

Sample Number	Sampled Date	Total Suspended Particulate (mg/m3)	Particulate Matter (PM-10) (mg/m3)	Barometric Pressure (mm Hg)	Atmospheric Temperature (°C)
2425471-8	Mar 22 - Mar 23, 2024	0.039	0.020	758	30
2425471-9	Mar 23 - Mar 24, 2024	0.031	0.021	758	28
2425471-10	Mar 24 - Mar 25, 2024	0.031	0.021	758	30
2425471-11	Mar 25 - Mar 26, 2024	0.029	0.017	758	31
2425471-12	Mar 26 - Mar 27, 2024	0.030	0.014	758	31
2425471-13	Mar 27 - Mar 28, 2024	0.031	0.018	758	28
2425471-14	Mar 28 - Mar 29, 2024	0.028	0.021	758	30
Guideline		0.33	0.12	-	-

Reference Method
Total Suspended Particulate : US EPA 40 CFR Part 50 Appendix B
Particulate Metter (PM-10) : US EPA 40 CFR Part 50 Appendix J

Guideline : Notification of the National Environmental Board. No.24, 2004 (B.E.2547) dated September 22, 2004
Sampled By : Chatchai Sukpia

Remark :
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Approved by
ThanitaK.
Thanita Kulsuriwong
Scientist (4)

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report may be reproduced in any form without written consent from the laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425471
Date Received : Apr 01, 2024
Date Reported : Apr 05, 2024
Report Number: 2926761-3

Page 1 of 1

Sample Description Air Quality
Location วัดฉนากลุงหญ้า
Date Analysis Commenced Apr 02, 2024
Condition of Sample Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one quartz filter paper (8x10 inch) placed in plastic bag

Sample Number	Sampled Date	Total Suspended Particulate (mg/m3)	Particulate Matter (PM-10) (mg/m3)	Barometric Pressure (mm Hg)	Atmospheric Temperature (°C)
2425471-15	Mar 22 - Mar 23, 2024	0.080	0.038	758	30
2425471-16	Mar 23 - Mar 24, 2024	0.058	0.028	758	28
2425471-17	Mar 24 - Mar 25, 2024	0.058	0.029	758	30
2425471-18	Mar 25 - Mar 26, 2024	0.066	0.026	758	31
2425471-19	Mar 26 - Mar 27, 2024	0.080	0.029	758	31
2425471-20	Mar 27 - Mar 28, 2024	0.066	0.034	758	28
2425471-21	Mar 28 - Mar 29, 2024	0.072	0.034	758	30
Guideline		0.33	0.12	-	-

Reference Method
Total Suspended Particulate : US EPA 40 CFR Part 50 Appendix B
Particulate Metter (PM-10) : US EPA 40 CFR Part 50 Appendix J

Guideline : Notification of the National Environmental Board. No.24, 2004 (B.E.2547) dated September 22, 2004
Sampled By : Chatchai Sukpia

Remark :
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Approved by
ThanitaK.
Thanita Kulsuriwong
Scientist (4)

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6403-74 / EMAIL S:\Reports_Air Ambient\7Days.rpt (3:36PM)

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425471
Date Received : Apr 01, 2024
Date Reported : Apr 05, 2024
Report Number: 2926761-4

Page 1 of 1

Sample Description Air Quality
Location วัดนาขยุล
Date Analysis Commenced Apr 02, 2024
Condition of Sample Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one quartz filter paper (8x10 inch) placed in plastic bag

Sample Number	Sampled Date	Total Suspended Particulate (mg/m3)	Particulate Matter (PM-10) (mg/m3)	Barometric Pressure (mm Hg)	Atmospheric Temperature (°C)
2425471-22	Mar 22 - Mar 23, 2024	0.079	0.033	758	30
2425471-23	Mar 23 - Mar 24, 2024	0.075	0.029	758	28
2425471-24	Mar 24 - Mar 25, 2024	0.072	0.029	758	30
2425471-25	Mar 25 - Mar 26, 2024	0.094	0.032	758	31
2425471-26	Mar 26 - Mar 27, 2024	0.084	0.031	758	31
2425471-27	Mar 27 - Mar 28, 2024	0.072	0.028	758	28
2425471-28	Mar 28 - Mar 29, 2024	0.072	0.032	758	30
Guideline		0.33	0.12	-	-

Reference Method
Total Suspended Particulate : US EPA 40 CFR Part 50 Appendix B
Particulate Metter (PM-10) : US EPA 40 CFR Part 50 Appendix J

Guideline : Notification of the National Environmental Board. No.24, 2004 (B.E.2547) dated September 22, 2004
Sampled By : Chatchai Sukpia

Remark :
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Approved by
ThanitaK.
Thanita Kulsuriwong
Scientist (4)

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report may be reproduced in any form without written consent from the laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

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6403-74 / EMAIL S:\Reports_Air Ambient\7Days.rpt (3:54PM)

Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425469
Date Received :Apr 01, 2024
Date Reported :Apr 08, 2024
Report Number :2926776-1

Sample Number 2425469-1 to 7
Parameter Wind Speed / Wind Direction
Location วัดประชุมมิตรบางรัง
Sampling Date Mar 22 - Mar 29, 2024
Sampling by Chatchai Sukpia

Time	Mar 22 - Mar 23, 2024		Mar 23 - Mar 24, 2024		Mar 24 - Mar 25, 2024		Mar 25 - Mar 26, 2024		Mar 26 - Mar 27, 2024		Mar 27 - Mar 28, 2024		Mar 28 - Mar 29, 2024	
	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)
10:00 AM - 11:00 AM	2.0	132.0 SE	2.0	166.0 SSE	0.8	168.0 SSE	0.8	146.0 SE	2.0	166.0 SSE	0.8	236.0 SW	1.8	172.0 S
11:00 AM - 12:00 PM	2.2	144.0 SE	1.8	134.0 SE	0.6	168.0 SSE	1.8	158.0 SSE	1.8	164.0 SSE	1.8	188.0 S	1.0	164.0 SSE
12:00 PM - 01:00 PM	2.0	138.0 SE	0.8	146.0 SE	2.4	160.0 SSE	2.1	162.0 SSE	1.1	166.0 SSE	1.2	177.0 S	1.4	176.0 S
01:00 PM - 02:00 PM	0.8	166.0 SSE	1.2	144.0 SE	1.8	169.0 S	2.0	169.0 S	2.1	174.0 S	2.0	174.0 S	1.7	166.0 SSE
02:00 PM - 03:00 PM	1.0	169.0 S	2.2	142.0 SE	2.2	178.0 S	1.9	180.0 S	0.8	170.0 S	1.4	188.0 S	2.4	168.0 SSE
03:00 PM - 04:00 PM	2.0	158.0 SSE	0.4	136.0 SE	2.0	182.0 S	2.1	178.0 S	1.6	174.0 S	1.9	176.0 S	1.6	173.0 S
04:00 PM - 05:00 PM	2.5	144.0 SE	0.9	133.0 SE	1.2	150.0 SSE	0.9	174.0 S	1.9	182.0 S	2.0	170.0 S	2.6	166.0 SSE
05:00 PM - 06:00 PM	0.8	133.0 SE	1.0	130.0 SE	0.6	146.0 SE	1.0	166.0 SSE	1.2	190.0 S	1.2	171.0 S	1.2	156.0 SSE
06:00 PM - 07:00 PM	1.4	148.0 SSE	0.6	138.0 SE	0.8	149.0 SSE	0.8	152.0 SSE	0.9	190.0 S	1.0	174.0 S	1.2	166.0 SSE
07:00 PM - 08:00 PM	0.6	124.0 SE	0.8	138.0 SE	0.9	162.0 SSE	0.5	148.0 SSE	1.0	184.0 S	0.8	158.0 SSE	0.8	153.0 SSE
08:00 PM - 09:00 PM	1.3	136.0 SE	1.2	140.0 SE	1.6	176.0 S	0.9	151.0 SSE	1.4	190.0 S	0.6	176.0 S	1.0	164.0 SSE
09:00 PM - 10:00 PM	0.4	144.0 SE	0.6	154.0 SSE	0.8	183.0 S	1.2	144.0 SE	0.8	189.0 S	0.5	170.0 S	0.8	158.0 SSE
10:00 PM - 11:00 PM	0.2	- -	0.2	- -	0.7	176.0 S	0.4	148.0 SSE	0.0	- -	0.2	- -	0.5	160.0 SSE
11:00 PM - 12:00 AM	0.0	- -	0.0	- -	0.3	181.0 S	0.0	- -	0.0	- -	0.0	- -	0.0	- -
12:00 AM - 01:00 AM	0.4	198.0 SSW	0.0	- -	0.4	169.0 S	0.0	- -	0.2	- -	0.0	- -	0.0	- -
01:00 AM - 02:00 AM	0.0	- -	0.2	- -	0.0	- -	0.0	- -	0.0	- -	0.0	- -	0.2	- -
02:00 AM - 03:00 AM	0.0	- -	0.0	- -	0.6	- -	1.2	168.0 SSE	0.0	- -	0.0	- -	0.0	- -
03:00 AM - 04:00 AM	0.8	228.0 SW	0.0	- -	0.6	174.0 S	0.8	163.0 SSE	0.8	181.0 S	0.6	168.0 SSE	0.0	- -
04:00 AM - 05:00 AM	0.4	218.0 SW	0.0	- -	0.4	178.0 S	1.0	158.0 SSE	1.0	177.0 S	0.4	158.0 SSE	0.9	176.0 S
05:00 AM - 06:00 AM	0.0	- -	0.0	- -	1.0	180.0 S	0.9	154.0 SSE	0.2	- -	0.0	- -	1.7	184.0 S
06:00 AM - 07:00 AM	0.6	176.0 S	0.4	229.0 SW	1.4	168.0 SSE	2.0	155.0 SSE	0.6	189.0 S	0.4	177.0 S	2.0	196.0 SSW
07:00 AM - 08:00 AM	1.2	165.0 SSE	2.8	160.0 SSE	1.8	186.0 S	2.2	148.0 SSE	0.9	163.0 SSE	0.8	186.0 S	1.2	185.0 S
08:00 AM - 09:00 AM	1.4	167.0 SSE	1.0	166.0 SSE	2.1	182.0 S	1.8	146.0 SE	1.5	328.0 NNW	1.5	168.0 SSE	0.9	154.0 SSE
09:00 AM - 10:00 AM	2.2	176.0 S	1.4	158.0 SSE	1.6	169.0 S	2.1	154.0 SSE	0.6	195.0 SSW	1.2	166.0 SSE	2.0	166.0 SSE

Reference Method : Cup Anemometer & Anodized Aluminium Vane Method

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by
Sarayuth Jittranont
Assistant General Manager

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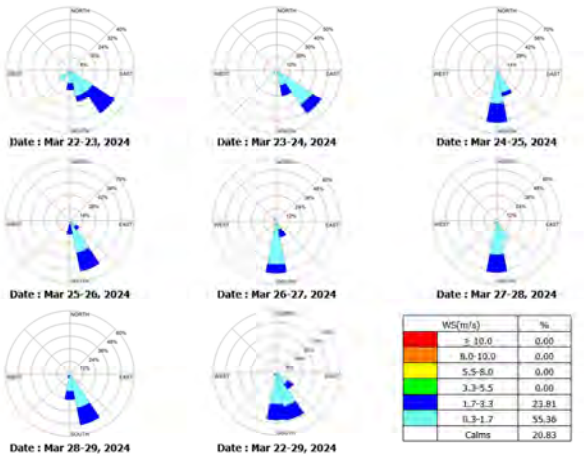
Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130

P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425469
Date Received :Apr 01, 2024
Date Reported :Apr 08, 2024
Report Number :2926776-1

Wind Rose



WS(m/s)	%
≥ 10.0	0.00
8.0-10.0	0.00
5.5-8.0	0.00
3.3-5.5	0.00
1.7-3.3	23.81
0.3-1.7	55.36
Calms	20.83

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Approved by
Serayuth Jittranont
Assistant General Manager

Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130

P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425439
Date Received : Mar 27, 2024
Date Reported : Apr 08, 2024
Report Number: 2926722-2

Sample Number	2425439-1
Sampled Date	Mar 27, 2024
Sample Description	Emission from Stationary Source
Location	HRSGs 1 (GPS 47P 0728137, 1405521)
Date Analysis Commenced	Mar 28, 2024
Condition of Sample	Extracted into one filter paper placed in plastic petri dish, one plastic bottle and one amber plastic bottle, refrigerated

Stack Description

Ambient Pressure	757	mmHg	Diameter	3.30	m	Oxygen	13.6	%
Ambient Temperature	32.0	°C	Shape	Circle		Carbon Dioxide	4.4	%
Type of Process	Combustion		Stack Temperature	141	°C	Gas Velocity	18.8	m/s
Type of Fuel	Natural Gas		Moisture	10.08	%	Flow Rate (Actual O2)	372286	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result at 7 %O_2	Result at 13.6 % O_2	Method	Testing Location
Air Testing								
Ammonia	02:40 PM - 03:10 PM	ppm	-	0.02	0.28	0.15	In-house method based on Method of Air Sampling and Analysis, 401	Rayong

Approved by
Thanita Kulsuriwong
Scientist (4)

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130

P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425439
Date Received : Mar 27, 2024
Date Reported : Apr 08, 2024
Report Number: 2926722-2

Sample Number	2425439-1
Sampled Date	Mar 27, 2024
Sample Description	Emission from Stationary Source
Location	HRSGs 1 (GPS 47P 0728137, 1405521)
Date Analysis Commenced	Mar 28, 2024
Condition of Sample	Extracted into one filter paper placed in plastic petri dish, one plastic bottle and one amber plastic bottle, refrigerated

Stack Description

Ambient Pressure	757	mmHg	Diameter	3.30	m	Oxygen	13.6	%
Ambient Temperature	32.0	°C	Shape	Circle		Carbon Dioxide	4.4	%
Type of Process	Combustion		Stack Temperature	141	°C	Gas Velocity	18.8	m/s
Type of Fuel	Natural Gas		Moisture	10.08	%	Flow Rate (Actual O2)	372286	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result Emission Rate	Method	Testing Location
Air Testing							
Ammonia	02:40 PM - 03:10 PM	g/s	-	-	0.010	Calculated	Rayong

Sampled By : Santi Chaichana

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Approved by
Thanita Kulsuriwong
Scientist (4)

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130

P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425436
Date Received : Apr 01, 2024
Date Reported : Apr 03, 2024
Report Number: 2955788-1

Sample Number	2425436-1
Parameter	Noise (Leq 24 hrs)
Location	บริเวณรั้วโรงงานด้านทางเข้าโครงการ
Measurement Date	Mar 22 - Mar 23, 2024
Measurement by	Chatchai Sukpia
Sound Level meter	Serial No. 623395

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	57.1	87.5	48.3
12:00 PM - 01:00 PM	51.7	72.3	47.3
01:00 PM - 02:00 PM	58.7	89.2	47.7
02:00 PM - 03:00 PM	53.8	78.0	47.9
03:00 PM - 04:00 PM	53.2	80.1	48.4
04:00 PM - 05:00 PM	55.0	75.9	49.7
05:00 PM - 06:00 PM	59.4	91.5	50.2
06:00 PM - 07:00 PM	54.4	77.2	50.2
07:00 PM - 08:00 PM	60.8	92.8	50.1
08:00 PM - 09:00 PM	51.7	69.9	49.4
09:00 PM - 10:00 PM	50.5	69.2	48.7
10:00 PM - 11:00 PM	50.2	67.3	48.6
11:00 PM - 12:00 AM	51.2	75.3	48.9
12:00 AM - 01:00 AM	51.3	64.7	50.1
01:00 AM - 02:00 AM	50.7	60.6	49.2
02:00 AM - 03:00 AM	50.7	61.0	49.6
03:00 AM - 04:00 AM	50.4	61.7	49.4
04:00 AM - 05:00 AM	51.5	72.9	49.7
05:00 AM - 06:00 AM	54.6	77.1	49.6
06:00 AM - 07:00 AM	55.8	79.2	48.9
07:00 AM - 08:00 AM	53.6	72.0	48.5
08:00 AM - 09:00 AM	54.2	80.3	47.9
09:00 AM - 10:00 AM	54.0	79.0	48.6
10:00 AM - 11:00 AM	52.0	73.9	48.3
Leq Average 24 hrs. (dB(A))	54.8		
Lmax (dB(A))		92.8	
L90 (dB(A))			48.8
Ldn (dB(A))	59.4		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management
Thanita Kulsuriwong
Scientist (4)

Approved by
Supot Salamteh
Section Head

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425436
Date Received : Apr 01, 2024
Date Reported : Apr 03, 2024
Report Number: 2955789-1

Sample Number	2425436-2
Parameter	Noise (Leq 24 hrs)
Location	บริเวณริมรั้วโรงงานด้านทางเข้าโครงการ
Measurement Date	Mar 23 - Mar 24, 2024
Measurement by	Chatchai Sukpia
Sound Level meter	Serial No. 623395

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	53.3	75.1	49.0
12:00 PM - 01:00 PM	53.2	74.8	49.0
01:00 PM - 02:00 PM	58.8	76.1	49.9
02:00 PM - 03:00 PM	55.1	80.1	50.4
03:00 PM - 04:00 PM	53.2	71.5	49.7
04:00 PM - 05:00 PM	55.0	81.6	49.4
05:00 PM - 06:00 PM	55.4	76.4	49.9
06:00 PM - 07:00 PM	57.3	88.8	49.4
07:00 PM - 08:00 PM	51.0	63.2	49.5
08:00 PM - 09:00 PM	51.1	60.3	49.5
09:00 PM - 10:00 PM	51.5	70.4	49.8
10:00 PM - 11:00 PM	51.6	72.2	49.6
11:00 PM - 12:00 AM	52.3	71.9	49.7
12:00 AM - 01:00 AM	51.1	67.5	49.6
01:00 AM - 02:00 AM	50.3	59.0	49.3
02:00 AM - 03:00 AM	50.9	70.5	49.2
03:00 AM - 04:00 AM	50.2	65.7	49.3
04:00 AM - 05:00 AM	50.0	65.4	48.8
05:00 AM - 06:00 AM	53.9	76.7	48.8
06:00 AM - 07:00 AM	57.0	87.0	48.6
07:00 AM - 08:00 AM	52.8	74.9	46.9
08:00 AM - 09:00 AM	53.9	80.9	46.9
09:00 AM - 10:00 AM	52.1	74.3	46.8
10:00 AM - 11:00 AM	52.2	75.4	46.7
Leq Average 24 hrs. (dB(A))	53.8		
Lmax (dB(A))		88.8	
L90 (dB(A))			49.3
Ldn (dB(A))	59.3		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management Thanita K.
Thanita Kulsuriwong
Scientist (4)

Approved by Supt S
Supot Salamteh
Section Head

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425436
Date Received : Apr 01, 2024
Date Reported : Apr 03, 2024
Report Number: 2955790-1

Sample Number	2425436-3
Parameter	Noise (Leq 24 hrs)
Location	บริเวณริมรั้วโรงงานด้านทางเข้าโครงการ
Measurement Date	Mar 24 - Mar 25, 2024
Measurement by	Chatchai Sukpia
Sound Level meter	Serial No. 623395

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	51.6	73.1	46.8
12:00 PM - 01:00 PM	50.9	72.4	47.3
01:00 PM - 02:00 PM	51.0	72.9	47.6
02:00 PM - 03:00 PM	51.7	75.1	47.4
03:00 PM - 04:00 PM	53.2	76.3	47.4
04:00 PM - 05:00 PM	50.3	71.6	47.2
05:00 PM - 06:00 PM	54.2	73.6	47.2
06:00 PM - 07:00 PM	63.1	96.0	47.5
07:00 PM - 08:00 PM	49.6	70.1	47.8
08:00 PM - 09:00 PM	50.6	73.8	48.2
09:00 PM - 10:00 PM	49.7	65.9	48.5
10:00 PM - 11:00 PM	50.2	65.8	48.6
11:00 PM - 12:00 AM	50.4	66.3	48.6
12:00 AM - 01:00 AM	49.5	60.1	48.3
01:00 AM - 02:00 AM	50.5	62.3	48.3
02:00 AM - 03:00 AM	50.0	62.8	48.8
03:00 AM - 04:00 AM	49.6	59.1	48.6
04:00 AM - 05:00 AM	50.2	72.2	48.7
05:00 AM - 06:00 AM	55.3	76.3	49.2
06:00 AM - 07:00 AM	55.3	78.8	48.9
07:00 AM - 08:00 AM	55.0	77.4	48.0
08:00 AM - 09:00 AM	57.8	82.2	47.5
09:00 AM - 10:00 AM	57.0	78.7	48.1
10:00 AM - 11:00 AM	54.7	76.3	47.6
Leq Average 24 hrs. (dB(A))	54.4		
Lmax (dB(A))		96.0	
L90 (dB(A))			48.0
Ldn (dB(A))	59.0		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management Thanita K.
Thanita Kulsuriwong
Scientist (4)

Approved by Supt S
Supot Salamteh
Section Head

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425436
Date Received : Apr 01, 2024
Date Reported : Apr 03, 2024
Report Number: 2955791-1

Sample Number	2425436-4
Parameter	Noise (Leq 24 hrs)
Location	บริเวณริมรั้วโรงงานด้านทางเข้าโครงการ
Measurement Date	Mar 25 - Mar 26, 2024
Measurement by	Chatchai Sukpia
Sound Level meter	Serial No. 623395

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	52.4	75.4	47.4
12:00 PM - 01:00 PM	54.5	78.5	47.7
01:00 PM - 02:00 PM	59.5	88.4	48.1
02:00 PM - 03:00 PM	60.7	88.3	48.0
03:00 PM - 04:00 PM	55.0	66.0	48.2
04:00 PM - 05:00 PM	55.0	75.6	48.2
05:00 PM - 06:00 PM	55.0	72.5	48.4
06:00 PM - 07:00 PM	55.5	82.0	47.7
07:00 PM - 08:00 PM	50.8	73.6	47.4
08:00 PM - 09:00 PM	49.6	67.9	47.7
09:00 PM - 10:00 PM	50.2	72.0	47.8
10:00 PM - 11:00 PM	50.5	73.0	47.6
11:00 PM - 12:00 AM	50.9	72.7	47.5
12:00 AM - 01:00 AM	50.3	75.1	47.7
01:00 AM - 02:00 AM	48.4	59.1	47.5
02:00 AM - 03:00 AM	48.9	65.2	47.9
03:00 AM - 04:00 AM	48.7	66.4	47.8
04:00 AM - 05:00 AM	50.5	75.2	48.1
05:00 AM - 06:00 AM	53.7	73.2	48.6
06:00 AM - 07:00 AM	54.7	74.6	48.3
07:00 AM - 08:00 AM	55.2	78.1	47.7
08:00 AM - 09:00 AM	58.5	85.4	48.6
09:00 AM - 10:00 AM	55.6	78.0	47.8
10:00 AM - 11:00 AM	53.9	77.9	47.3
Leq Average 24 hrs. (dB(A))	54.6		
Lmax (dB(A))		88.4	
L90 (dB(A))			47.8
Ldn (dB(A))	58.7		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management Thanita K.
Thanita Kulsuriwong
Scientist (4)

Approved by Supt S
Supot Salamteh
Section Head

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425436
Date Received : Apr 01, 2024
Date Reported : Apr 03, 2024
Report Number: 2955792-1

Sample Number	2425436-5
Parameter	Noise (Leq 24 hrs)
Location	บริเวณริมรั้วโรงงานด้านทางเข้าโครงการ
Measurement Date	Mar 26 - Mar 27, 2024
Measurement by	Chatchai Sukpia
Sound Level meter	Serial No. 623395

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	52.7	75.9	47.1
12:00 PM - 01:00 PM	55.1	76.3	47.4
01:00 PM - 02:00 PM	54.2	82.2	48.0
02:00 PM - 03:00 PM	56.0	80.0	48.7
03:00 PM - 04:00 PM	56.2	82.3	49.5
04:00 PM - 05:00 PM	55.5	77.4	49.3
05:00 PM - 06:00 PM	55.9	74.0	49.3
06:00 PM - 07:00 PM	64.2	96.1	49.2
07:00 PM - 08:00 PM	52.3	78.4	48.6
08:00 PM - 09:00 PM	50.6	62.7	48.6
09:00 PM - 10:00 PM	50.1	68.9	48.6
10:00 PM - 11:00 PM	49.2	64.2	47.9
11:00 PM - 12:00 AM	52.6	77.2	48.4
12:00 AM - 01:00 AM	49.8	61.0	48.3
01:00 AM - 02:00 AM	50.2	70.7	48.3
02:00 AM - 03:00 AM	49.6	70.7	48.3
03:00 AM - 04:00 AM	49.0	64.3	48.1
04:00 AM - 05:00 AM	49.8	72.7	48.1
05:00 AM - 06:00 AM	58.3	88.9	49.0
06:00 AM - 07:00 AM	56.3	79.6	48.7
07:00 AM - 08:00 AM	55.1	75.1	47.0
08:00 AM - 09:00 AM	71.1	82.0	47.6
09:00 AM - 10:00 AM	64.2	80.5	51.6
10:00 AM - 11:00 AM	57.3	77.2	47.7
Leq Average 24 hrs. (dB(A))	59.9		
Lmax (dB(A))		96.1	
L90 (dB(A))			48.3
Ldn (dB(A))	62.2		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management Thanita K.
Thanita Kulsuriwong
Scientist (4)

Approved by Supt S
Supot Salamteh
Section Head

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425436
Date Received : Apr 01, 2024
Date Reported : Apr 03, 2024
Report Number: 2955793-1

Sample Number 2425436-6
Parameter Noise (Leq 24 hrs)
Location บริเวณจุดรับรถงานด้านทางเข้าโครงการ
Measurement Date Mar 27 - Mar 28, 2024
Measurement by Chatchai Sukpia
Sound Level meter Serial No. 623395

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	52.8	72.8	48.1
12:00 PM - 01:00 PM	55.7	75.9	48.7
01:00 PM - 02:00 PM	55.7	82.4	48.9
02:00 PM - 03:00 PM	56.1	78.9	49.4
03:00 PM - 04:00 PM	56.4	83.5	49.7
04:00 PM - 05:00 PM	63.9	93.5	49.3
05:00 PM - 06:00 PM	55.3	78.0	49.9
06:00 PM - 07:00 PM	55.4	79.9	49.7
07:00 PM - 08:00 PM	53.5	79.9	49.3
08:00 PM - 09:00 PM	51.1	65.9	49.8
09:00 PM - 10:00 PM	51.3	70.7	49.6
10:00 PM - 11:00 PM	50.9	68.8	49.5
11:00 PM - 12:00 AM	53.1	72.8	50.1
12:00 AM - 01:00 AM	51.9	73.0	49.8
01:00 AM - 02:00 AM	51.2	68.0	49.7
02:00 AM - 03:00 AM	51.3	57.0	50.3
03:00 AM - 04:00 AM	50.9	75.4	49.7
04:00 AM - 05:00 AM	51.4	71.4	49.4
05:00 AM - 06:00 AM	56.0	81.0	50.4
06:00 AM - 07:00 AM	55.7	77.9	49.7
07:00 AM - 08:00 AM	54.7	75.3	48.2
08:00 AM - 09:00 AM	56.4	84.4	48.7
09:00 AM - 10:00 AM	54.4	77.2	47.9
10:00 AM - 11:00 AM	53.5	74.7	47.7
Leq Average 24 hrs. (dB(A))	55.4		
Lmax (dB(A))		93.5	
L90 (dB(A))			49.5
Ldn (dB(A))	60.1		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการระบาย และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredted laboratory complying with the ISO/IEC 17025.

Technical Management Thanita K.
Thanita Kulsuriwong
Scientist (4)

Approved by Supt S
Supot Salamteh
Section Head

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425436
Date Received : Apr 01, 2024
Date Reported : Apr 03, 2024
Report Number: 2955794-1

Sample Number 2425436-7
Parameter Noise (Leq 24 hrs)
Location บริเวณจุดรับรถงานด้านทางเข้าโครงการ
Measurement Date Mar 28 - Mar 29, 2024
Measurement by Chatchai Sukpia
Sound Level meter Serial No. 623395

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	53.7	79.2	47.5
12:00 PM - 01:00 PM	54.8	82.3	47.7
01:00 PM - 02:00 PM	56.5	85.4	48.3
02:00 PM - 03:00 PM	53.5	79.9	48.7
03:00 PM - 04:00 PM	61.6	90.1	48.9
04:00 PM - 05:00 PM	54.4	74.6	49.4
05:00 PM - 06:00 PM	55.0	76.0	49.2
06:00 PM - 07:00 PM	56.9	87.4	49.6
07:00 PM - 08:00 PM	54.1	78.2	49.0
08:00 PM - 09:00 PM	50.7	70.6	48.8
09:00 PM - 10:00 PM	50.0	68.2	48.5
10:00 PM - 11:00 PM	50.2	69.4	48.7
11:00 PM - 12:00 AM	51.1	74.5	48.3
12:00 AM - 01:00 AM	49.6	69.7	48.4
01:00 AM - 02:00 AM	50.9	79.6	48.3
02:00 AM - 03:00 AM	49.6	61.3	48.6
03:00 AM - 04:00 AM	49.2	68.9	48.1
04:00 AM - 05:00 AM	51.6	73.9	48.4
05:00 AM - 06:00 AM	55.0	79.3	49.4
06:00 AM - 07:00 AM	56.2	79.5	48.5
07:00 AM - 08:00 AM	55.0	73.2	48.5
08:00 AM - 09:00 AM	53.5	80.4	48.4
09:00 AM - 10:00 AM	54.4	82.3	48.3
10:00 AM - 11:00 AM	54.1	78.2	49.0
Leq Average 24 hrs. (dB(A))	54.5		
Lmax (dB(A))		90.3	
L90 (dB(A))			48.5
Ldn (dB(A))	59.3		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการระบาย และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredted laboratory complying with the ISO/IEC 17025.

Technical Management Thanita K.
Thanita Kulsuriwong
Scientist (4)

Approved by Supt S
Supot Salamteh
Section Head

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425436
Date Received : Apr 01, 2024
Date Reported : Apr 03, 2024
Report Number: 2955795-1

Sample Number 2425436-8
Parameter Noise (Leq 24 hrs)
Location บ้านสำนักแขว่าง
Measurement Date Mar 22 - Mar 23, 2024
Measurement by Chatchai Sukpia
Sound Level meter Serial No. 623392

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	52.5	84.0	46.5
12:00 PM - 01:00 PM	54.9	84.6	47.3
01:00 PM - 02:00 PM	50.8	77.6	47.7
02:00 PM - 03:00 PM	49.4	71.7	46.8
03:00 PM - 04:00 PM	49.0	71.1	46.2
04:00 PM - 05:00 PM	49.6	68.7	46.6
05:00 PM - 06:00 PM	55.2	93.6	48.8
06:00 PM - 07:00 PM	53.3	77.4	49.5
07:00 PM - 08:00 PM	52.6	78.6	49.5
08:00 PM - 09:00 PM	51.5	76.0	49.3
09:00 PM - 10:00 PM	51.6	64.5	49.6
10:00 PM - 11:00 PM	49.8	67.3	48.4
11:00 PM - 12:00 AM	49.6	65.5	48.0
12:00 AM - 01:00 AM	54.6	80.3	47.9
01:00 AM - 02:00 AM	49.1	77.5	47.7
02:00 AM - 03:00 AM	48.2	53.1	47.2
03:00 AM - 04:00 AM	48.2	56.3	47.2
04:00 AM - 05:00 AM	48.5	62.3	47.3
05:00 AM - 06:00 AM	48.3	53.5	47.3
06:00 AM - 07:00 AM	50.2	71.3	47.8
07:00 AM - 08:00 AM	51.9	77.4	48.7
08:00 AM - 09:00 AM	51.4	69.0	47.3
09:00 AM - 10:00 AM	50.1	68.4	46.5
10:00 AM - 11:00 AM	49.4	69.6	40.0
Leq Average 24 hrs. (dB(A))	51.4		
Lmax (dB(A))		93.6	
L90 (dB(A))			47.3
Ldn (dB(A))	56.9		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการระบาย และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredted laboratory complying with the ISO/IEC 17025.

Technical Management Thanita K.
Thanita Kulsuriwong
Scientist (4)

Approved by Supt S
Supot Salamteh
Section Head

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425436
Date Received : Apr 01, 2024
Date Reported : Apr 03, 2024
Report Number: 2955796-1

Sample Number 2425436-9
Parameter Noise (Leq 24 hrs)
Location บ้านสำนักแขว่าง
Measurement Date Mar 23 - Mar 24, 2024
Measurement by Chatchai Sukpia
Sound Level meter Serial No. 623392

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	49.4	70.1	46.9
12:00 PM - 01:00 PM	49.3	65.8	47.0
01:00 PM - 02:00 PM	50.6	60.3	47.7
02:00 PM - 03:00 PM	50.5	71.0	47.5
03:00 PM - 04:00 PM	56.5	73.4	48.7
04:00 PM - 05:00 PM	50.6	67.3	48.2
05:00 PM - 06:00 PM	51.6	71.1	48.7
06:00 PM - 07:00 PM	53.2	71.7	49.9
07:00 PM - 08:00 PM	52.7	69.4	50.0
08:00 PM - 09:00 PM	51.7	72.4	48.8
09:00 PM - 10:00 PM	52.4	71.7	49.6
10:00 PM - 11:00 PM	52.5	66.6	49.5
11:00 PM - 12:00 AM	53.1	70.9	49.7
12:00 AM - 01:00 AM	52.9	58.6	51.0
01:00 AM - 02:00 AM	53.5	68.8	50.8
02:00 AM - 03:00 AM	53.5	59.0	51.5
03:00 AM - 04:00 AM	53.5	61.1	51.1
04:00 AM - 05:00 AM	53.6	59.2	51.4
05:00 AM - 06:00 AM	53.5	60.9	51.7
06:00 AM - 07:00 AM	54.0	70.7	51.6
07:00 AM - 08:00 AM	54.5	70.6	52.4
08:00 AM - 09:00 AM	55.0	74.3	50.3
09:00 AM - 10:00 AM	51.0	65.0	48.3
10:00 AM - 11:00 AM	50.3	72.5	46.6
Leq Average 24 hrs. (dB(A))	52.8		
Lmax (dB(A))		74.3	
L90 (dB(A))			49.6
Ldn (dB(A))	59.7		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการระบาย และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredted laboratory complying with the ISO/IEC 17025.

Technical Management Thanita K.
Thanita Kulsuriwong
Scientist (4)

Approved by Supt S
Supot Salamteh
Section Head

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425436
Date Received : Apr 01, 2024
Date Reported : Apr 03, 2024
Report Number: 2955797-1

Sample Number	2425436-10
Parameter	Noise (Leq 24 hrs)
Location	บ้านสำนักแร่ง
Measurement Date	Mar 24 - Mar 25, 2024
Measurement by	Chatchai Sukpia
Sound Level meter	Serial No. 623392

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	50.1	68.2	48.3
12:00 PM - 01:00 PM	48.7	62.1	46.9
01:00 PM - 02:00 PM	49.3	67.4	46.9
02:00 PM - 03:00 PM	48.8	70.7	47.0
03:00 PM - 04:00 PM	49.4	66.6	47.5
04:00 PM - 05:00 PM	50.2	70.2	48.1
05:00 PM - 06:00 PM	50.6	68.2	48.5
06:00 PM - 07:00 PM	50.8	75.6	47.3
07:00 PM - 08:00 PM	49.5	65.9	47.1
08:00 PM - 09:00 PM	50.0	71.5	47.4
09:00 PM - 10:00 PM	56.6	91.5	47.3
10:00 PM - 11:00 PM	49.3	69.4	47.6
11:00 PM - 12:00 AM	51.1	78.9	47.3
12:00 AM - 01:00 AM	54.9	77.8	46.8
01:00 AM - 02:00 AM	49.2	78.4	47.3
02:00 AM - 03:00 AM	54.1	81.7	47.3
03:00 AM - 04:00 AM	48.7	57.2	47.4
04:00 AM - 05:00 AM	48.6	57.2	47.6
05:00 AM - 06:00 AM	56.1	80.6	47.5
06:00 AM - 07:00 AM	52.4	76.7	47.8
07:00 AM - 08:00 AM	51.7	71.3	48.8
08:00 AM - 09:00 AM	50.9	64.8	48.0
09:00 AM - 10:00 AM	50.7	74.2	47.8
10:00 AM - 11:00 AM	50.4	70.2	46.0
Leq Average 24 hrs. (dB(A))	51.6		
Lmax (dB(A))		91.5	
L90 (dB(A))			47.4
Ldn (dB(A))	58.7		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management ThanitaK.
Thanita Kulsuriwong
Scientist (4)

Approved by Supt S
Supot Salamteh
Section Head

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425436
Date Received : Apr 01, 2024
Date Reported : Apr 03, 2024
Report Number: 2955798-1

Sample Number	2425436-11
Parameter	Noise (Leq 24 hrs)
Location	บ้านสำนักแร่ง
Measurement Date	Mar 25 - Mar 26, 2024
Measurement by	Chatchai Sukpia
Sound Level meter	Serial No. 623392

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	49.3	65.2	47.4
12:00 PM - 01:00 PM	49.0	63.4	47.2
01:00 PM - 02:00 PM	50.9	68.7	47.2
02:00 PM - 03:00 PM	64.8	88.0	57.3
03:00 PM - 04:00 PM	66.1	88.9	64.0
04:00 PM - 05:00 PM	64.1	74.0	63.6
05:00 PM - 06:00 PM	69.4	88.5	64.0
06:00 PM - 07:00 PM	64.9	89.9	60.3
07:00 PM - 08:00 PM	65.2	85.6	61.0
08:00 PM - 09:00 PM	69.4	87.1	57.2
09:00 PM - 10:00 PM	69.8	98.1	57.4
10:00 PM - 11:00 PM	68.0	86.9	65.0
11:00 PM - 12:00 AM	65.8	92.3	64.6
12:00 AM - 01:00 AM	64.9	71.3	64.5
01:00 AM - 02:00 AM	65.1	74.9	64.5
02:00 AM - 03:00 AM	65.2	75.3	64.7
03:00 AM - 04:00 AM	64.8	67.7	64.4
04:00 AM - 05:00 AM	65.0	74.8	64.4
05:00 AM - 06:00 AM	64.8	74.7	64.2
06:00 AM - 07:00 AM	64.2	67.1	63.8
07:00 AM - 08:00 AM	64.5	74.5	63.9
08:00 AM - 09:00 AM	64.4	68.4	64.0
09:00 AM - 10:00 AM	64.5	76.3	64.0
10:00 AM - 11:00 AM	64.5	76.1	64.0
Leq Average 24 hrs. (dB(A))	65.5		
Lmax (dB(A))		98.1	
L90 (dB(A))			64.0
Ldn (dB(A))	71.9		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management ThanitaK.
Thanita Kulsuriwong
Scientist (4)

Approved by Supt S
Supot Salamteh
Section Head

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425436
Date Received : Apr 01, 2024
Date Reported : Apr 03, 2024
Report Number: 2955799-1

Sample Number	2425436-12
Parameter	Noise (Leq 24 hrs)
Location	บ้านสำนักแร่ง
Measurement Date	Mar 26 - Mar 27, 2024
Measurement by	Chatchai Sukpia
Sound Level meter	Serial No. 623392

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	64.9	81.1	64.1
12:00 PM - 01:00 PM	68.7	92.0	65.7
01:00 PM - 02:00 PM	64.2	83.3	59.7
02:00 PM - 03:00 PM	62.6	83.9	58.8
03:00 PM - 04:00 PM	67.3	84.8	58.6
04:00 PM - 05:00 PM	58.3	69.6	57.5
05:00 PM - 06:00 PM	63.0	89.6	57.7
06:00 PM - 07:00 PM	65.6	88.0	60.0
07:00 PM - 08:00 PM	63.6	82.2	59.4
08:00 PM - 09:00 PM	63.6	88.2	60.0
09:00 PM - 10:00 PM	60.4	83.9	58.0
10:00 PM - 11:00 PM	66.1	91.9	57.9
11:00 PM - 12:00 AM	68.3	91.4	64.5
12:00 AM - 01:00 AM	65.3	76.1	64.6
01:00 AM - 02:00 AM	65.2	76.6	64.7
02:00 AM - 03:00 AM	64.9	67.6	64.5
03:00 AM - 04:00 AM	65.3	75.1	64.8
04:00 AM - 05:00 AM	65.2	74.8	64.6
05:00 AM - 06:00 AM	65.4	77.3	64.0
06:00 AM - 07:00 AM	64.5	67.5	64.1
07:00 AM - 08:00 AM	64.7	76.3	64.1
08:00 AM - 09:00 AM	64.7	75.8	64.1
09:00 AM - 10:00 AM	64.5	69.2	64.1
10:00 AM - 11:00 AM	64.9	87.1	64.1
Leq Average 24 hrs. (dB(A))	65.1		
Lmax (dB(A))		92.0	
L90 (dB(A))			64.1
Ldn (dB(A))	72.0		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management ThanitaK.
Thanita Kulsuriwong
Scientist (4)

Approved by Supt S
Supot Salamteh
Section Head

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425436
Date Received : Apr 01, 2024
Date Reported : Apr 03, 2024
Report Number: 2955800-1

Sample Number	2425436-13
Parameter	Noise (Leq 24 hrs)
Location	บ้านสำนักแร่ง
Measurement Date	Mar 27 - Mar 28, 2024
Measurement by	Chatchai Sukpia
Sound Level meter	Serial No. 623392

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	64.9	82.9	64.3
12:00 PM - 01:00 PM	63.9	83.3	56.6
01:00 PM - 02:00 PM	69.5	90.2	61.3
02:00 PM - 03:00 PM	63.2	85.1	52.1
03:00 PM - 04:00 PM	66.9	87.8	56.4
04:00 PM - 05:00 PM	62.6	70.2	56.1
05:00 PM - 06:00 PM	66.5	87.3	56.8
06:00 PM - 07:00 PM	69.4	95.3	60.9
07:00 PM - 08:00 PM	66.2	83.7	61.0
08:00 PM - 09:00 PM	65.2	88.5	59.7
09:00 PM - 10:00 PM	64.9	89.6	56.9
10:00 PM - 11:00 PM	65.7	81.0	64.4
11:00 PM - 12:00 AM	65.8	81.2	64.4
12:00 AM - 01:00 AM	65.0	78.4	64.4
01:00 AM - 02:00 AM	65.8	83.7	64.3
02:00 AM - 03:00 AM	66.6	81.9	64.3
03:00 AM - 04:00 AM	64.7	78.2	64.3
04:00 AM - 05:00 AM	65.0	71.2	64.0
05:00 AM - 06:00 AM	65.7	71.6	57.5
06:00 AM - 07:00 AM	67.4	72.4	64.7
07:00 AM - 08:00 AM	65.9	70.7	63.8
08:00 AM - 09:00 AM	64.3	71.0	58.4
09:00 AM - 10:00 AM	68.4	77.0	64.1
10:00 AM - 11:00 AM	64.5	66.9	64.1
Leq Average 24 hrs. (dB(A))	66.2		
Lmax (dB(A))		95.3	
L90 (dB(A))			61.3
Ldn (dB(A))	72.6		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management ThanitaK.
Thanita Kulsuriwong
Scientist (4)

Approved by Supt S
Supot Salamteh
Section Head

Analysis / Test Report

TESTING
No 0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425436
Date Received : Apr 01, 2024
Date Reported : Apr 03, 2024
Report Number: 2955801-1

Sample Number	2425436-14
Parameter	Noise (Leq 24 hrs)
Location	มาบสาหิมแก่ง
Measurement Date	Mar 28 - Mar 29, 2024
Measurement by	Chatchai Sukpia
Sound Level meter	Serial No. 623392

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	64.7	81.7	64.1
12:00 PM - 01:00 PM	69.7	100.4	65.7
01:00 PM - 02:00 PM	68.2	85.7	62.9
02:00 PM - 03:00 PM	64.4	82.8	59.3
03:00 PM - 04:00 PM	65.3	75.1	64.8
04:00 PM - 05:00 PM	65.2	74.8	64.6
05:00 PM - 06:00 PM	65.4	77.3	64.0
06:00 PM - 07:00 PM	64.5	67.5	64.1
07:00 PM - 08:00 PM	65.2	75.3	64.7
08:00 PM - 09:00 PM	64.8	67.7	64.4
09:00 PM - 10:00 PM	65.0	74.8	64.4
10:00 PM - 11:00 PM	64.8	74.7	64.2
11:00 PM - 12:00 AM	64.2	67.1	63.8
12:00 AM - 01:00 AM	54.6	80.3	47.9
01:00 AM - 02:00 AM	49.1	77.5	47.7
02:00 AM - 03:00 AM	48.2	53.1	47.2
03:00 AM - 04:00 AM	48.2	56.3	47.2
04:00 AM - 05:00 AM	48.5	62.3	47.3
05:00 AM - 06:00 AM	56.1	80.6	47.5
06:00 AM - 07:00 AM	52.4	76.7	47.8
07:00 AM - 08:00 AM	51.7	71.3	48.8
08:00 AM - 09:00 AM	50.9	64.8	48.8
09:00 AM - 10:00 AM	50.7	74.2	47.8
10:00 AM - 11:00 AM	64.1	74.0	63.6
Leq Average 24 hrs. (dB(A))	63.5		
Lmax (dB(A))		100.4	
L90 (dB(A))			62.9
Ldn (dB(A))	66.8		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงจากการระบาย และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management Thanitak.
Thanita Kusumlwong
Scientist (4)

Approved by Supot S
Supot Salamteh
Section Head

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location: CUP 4

Lot ID: 23147571
Date Received : Jan 09, 2024
Date Reported : Jan 17, 2024
Report Number : 2887600-1

Sample Number	23147571-1
Sampled Date	Jan 09, 2024 2:25 PM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Jan 09, 2024
Condition of Sample	Contained in one BOD bottle, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	<25	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	4	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C		-	-	7.7	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Residual Free Chlorine *	mg/L	-	0.1	<0.1	≤1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Cl (F)	Rayong
Temperature *	Degree C	-	-	31.8	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	1	5	48	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	1.3	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	8	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Technical Management N.Banchongkit
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-ง-9445

Approved by D.Changchon
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-9442

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report may be reproduced in any form without written consent from the laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location: CUP 4

Lot ID: 23147571
Date Received : Jan 09, 2024
Date Reported : Jan 17, 2024
Report Number : 2887600-1

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Pattarapol Sawangjaitam ทะเบียนเลขที่ ว-204-ง-0002

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management N.Banchongkit
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-ง-9445

Approved by D.Changchon
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-9442

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Analysis / Test Report

TESTING
No.0009

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location: CUP 4

Lot ID: 23147571
Date Received : Jan 09, 2024
Date Reported : Jan 17, 2024
Report Number : 2887600-2

Sample Number	23147571-1
Sampled Date	Jan 09, 2024 2:25 PM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Jan 10, 2024
Condition of Sample	Contained in one BOD bottle, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/L	0.0003	0.0005	0.47	≤2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Pattarapol Sawangjaitam ทะเบียนเลขที่ ว-204-ง-0002

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management Sawitree N.
Sawitree Noisangiam
Manager
ทะเบียนเลขที่ ว-204-ง-4709

Approved by Kanokkorn Anek
Kanokkorn Anek
Senior Manager
ทะเบียนเลขที่ ว-204-ก-6111

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report may be reproduced in any form without written consent from the laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

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Analysis / Test Report

TESTING
No.0009

Lot ID: 23147571

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location: CUP 4

Date Received : Jan 09, 2024
Date Reported : Jan 17, 2024
Report Number : 2887600-3

Sample Number	23147571-1
Sampled Date	Jan 09, 2024 2:25 PM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Jan 09, 2024
Condition of Sample	Contained in one BOD bottle, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Iron	mg/L	0.003	0.005	2.63	≤10.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok
Water Testing							
Calcium Hardness as CaCO3 *	mg/L	-	1	19	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3500-Ca (B)	Bangkok
Coriductivity at 25 Degree C *	micromhos/cm	-	0.5	166	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2510 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	8.1	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-O (C)	Rayong
Flow rate *	m3/s	-	-	0.000	No Standard	Flow meter	Rayong
Nitrate as N *	mg/L	0.015	0.05	1.11	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-NO3 (E)	Rayong
Silica as SiO2 *	mg/L	0.2	0.5	4.0	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SiO2 (C)	Rayong
Total Alkalinity as CaCO3 *	mg/L	1	1	52	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2320 B	Rayong
Total Hardness as CaCO3 *	mg/L	-	1	114	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2340 C	Rayong

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report may be reproduced in any form without written consent from the laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by
Siriluk P.
Siriluk Puengpang
Section Head

Analysis / Test Report

TESTING
No.0009

Lot ID: 23147571

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location: CUP 4

Date Received : Jan 09, 2024
Date Reported : Jan 17, 2024
Report Number : 2887600-3

Sample Number	23147571-1
Sampled Date	Jan 09, 2024 2:25 PM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Jan 09, 2024
Condition of Sample	Contained in one BOD bottle, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Turbidity *	NTU	-	0.1	18.0	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2130 B	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Pattarapol Sawangjaitam

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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Approved by
Siriluk P.
Siriluk Puengpang
Section Head

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Analysis / Test Report

TESTING
No.0042

Lot ID: 2412708

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Feb 13, 2024
Date Reported : Feb 21, 2024
Report Number : 2917214-1

Sample Number	2412708-1
Sampled Date	Feb 13, 2024 2:30 PM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Feb 13, 2024
Condition of Sample	Contained in one amber glass bottle, one BOD bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	<25	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C	-	-	-	7.7	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Residual Free Chlorine *	mg/L	-	0.1	<0.1	≤1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Cl (F)	Rayong
Temperature *	Degree C	-	-	31.9	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	84	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	2.0	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	6	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Technical Management
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-ง-9445

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-9442

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Analysis / Test Report

TESTING
No.0042

Lot ID: 2412708

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Feb 13, 2024
Date Reported : Feb 21, 2024
Report Number : 2917214-1

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Chainusorn Lertnanthakunchai ทะเบียนเลขที่ ว-323-ง-9461 , Pattarapol Sawangjaitam ทะเบียนเลขที่ ว-204-ง-0002

Remark :
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Technical Management
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-ง-9445

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-9442

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Analysis / Test Report

TESTING
No.0009

Lot ID: 2412708

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Feb 13, 2024
Date Reported : Feb 21, 2024
Report Number : 2917214-2

Sample Number	2412708-1
Sampled Date	Feb 13, 2024 2:30 PM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Feb 14, 2024
Condition of Sample	Contained in one amber glass bottle, one BOD bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/L	0.0003	0.0005	0.08	≤2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Chainusorn Lertnanthakunchai ทะเบียนเลขที่ ว-323-ง-9461 , Pattarapol Sawangjaitam ทะเบียนเลขที่ ว-204-ง-0002

Remark :
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- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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Technical Management
Sawitree Noisangiam
Manager
ทะเบียนเลขที่ ว-204-ง-4709

Approved by
Kanokkorn Anek
Senior Manager
ทะเบียนเลขที่ ว-204-ง-6111

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Analysis / Test Report

TESTING
No.0009

Lot ID: 2412708

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Feb 13, 2024
Date Reported : Feb 21, 2024
Report Number : 2917214-3

Sample Number	2412708-1
Sampled Date	Feb 13, 2024 2:30 PM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Feb 13, 2024
Condition of Sample	Contained in one amber glass bottle, one BOD bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Iron	mg/L	0.003	0.005	0.37	≤10.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok
Water Testing							
Calcium Hardness as CaCO3 *	mg/L	-	1	15	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3500-Ca (B)	Bangkok
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	155	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2510 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	9.4	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-O (C)	Rayong
Flow rate *	m3/s	-	-	0.000	No Standard	Flow meter	Rayong
Nitrate as N *	mg/L	0.015	0.05	1.84	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-NO3 (E)	Rayong
Silica as SiO2 *	mg/L	0.2	0.5	3.0	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SiO2 (C)	Rayong
Total Alkalinity as CaCO3 *	mg/L	1	1	37	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2320 B	Rayong
Total Hardness as CaCO3 *	mg/L	-	1	105	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2340 C	Rayong

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Approved by
Sawitree Noisangiam
Manager

Analysis / Test Report

TESTING
No.0009

Lot ID: 2412708

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Feb 13, 2024
Date Reported : Feb 21, 2024
Report Number : 2917214-3

Sample Number	2412708-1
Sampled Date	Feb 13, 2024 2:30 PM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Feb 13, 2024
Condition of Sample	Contained in one amber glass bottle, one BOD bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Turbidity *	NTU	-	0.1	4.2	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2130 B	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Chainusorn Lertnanthakunchai , Pattarapol Sawangjaitam

Remark :
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Sawitree Noisangiam
Manager

Analysis / Test Report

TESTING
No.0042

Lot ID: 2425981

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location: CUP 4

Date Received : Mar 12, 2024
Date Reported : Mar 20, 2024
Report Number : 2942236-1

Sample Number	2425981-1
Sampled Date	Mar 12, 2024 2:40 PM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Mar 12, 2024
Condition of Sample	Contained in one amber glass bottle, two glass vials and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	<25	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C		-	-	7.7	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Residual Free Chlorine *	mg/L	-	0.1	0.1	≤1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Cl (F)	Rayong
Temperature *	Degree C	-	-	30.6	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	138	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	2.2	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	6	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Technical Management
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-ง-9445

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ง-9442

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Analysis / Test Report

TESTING
No.0042

Lot ID: 2425981

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location: CUP 4

Date Received : Mar 12, 2024
Date Reported : Mar 20, 2024
Report Number : 2942238-1

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Chainusorn Lertnanthakunchai ทะเบียนเลขที่ ว-323-ง-9461 , Pattarapol Sawangjaitam ทะเบียนเลขที่ ว-204-ง-0002

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Technical Management
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-ง-9445

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ง-9442

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Analysis / Test Report

TESTING
No.0009

Lot ID: 2425981

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location: CUP 4

Date Received : Mar 12, 2024
Date Reported : Mar 20, 2024
Report Number : 2942238-2

Sample Number 2425981-1
Sampled Date Mar 12, 2024 2:40 PM
Sample Description Wastewater
Location Holding pond 320 m3
Date Analysis Commenced Mar 13, 2024
Condition of Sample Contained in one amber glass bottle, two glass vials and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/L	0.0003	0.0005	0.09	≤2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Chainusorn Lertnanthakunchai ทะเบียนเลขที่ ว-323-ง-9461 , Pattarapol Sawangjaitam ทะเบียนเลขที่ ว-204-ง-0002

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Technical Management
Sawitree Noisangjam
Manager
ทะเบียนเลขที่ ว-204-ง-0007

Approved by
Kanokkorn Anek
Senior Manager
ทะเบียนเลขที่ ว-204-ง-0004

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Analysis / Test Report

TESTING
No.0009

Lot ID: 2425981

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location: CUP 4

Date Received : Mar 12, 2024
Date Reported : Mar 20, 2024
Report Number : 2942238-3

Sample Number 2425981-1
Sampled Date Mar 12, 2024 2:40 PM
Sample Description Wastewater
Location Holding pond 320 m3
Date Analysis Commenced Mar 12, 2024
Condition of Sample Contained in one amber glass bottle, two glass vials and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Iron	mg/L	0.003	0.005	1.67	≤10.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok
Water Testing							
Calcium Hardness as CaCO3 *	mg/L	-	1	16	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3500-Ca (B)	Bangkok
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	207	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2510 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	4.4	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-O (C)	Rayong
Flow rate *	m3/s	-	-	0.005	No Standard	Flow meter	Rayong
Nitrate as N *	mg/L	0.015	0.05	1.12	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-NO3 (E)	Rayong
Silica as SiO2 *	mg/L	0.2	0.5	3.8	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SiO2 (C)	Rayong
Total Alkalinity as CaCO3 *	mg/L	1	1	64	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2320 B	Rayong
Total Hardness as CaCO3 *	mg/L	-	1	26	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2340 C	Rayong

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Approved by
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ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Analysis / Test Report

TESTING
No.0009

Lot ID: 2425981

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location: CUP 4

Date Received : Mar 12, 2024
Date Reported : Mar 20, 2024
Report Number : 2942238-3

Sample Number 2425981-1
Sampled Date Mar 12, 2024 2:40 PM
Sample Description Wastewater
Location Holding pond 320 m3
Date Analysis Commenced Mar 12, 2024
Condition of Sample Contained in one amber glass bottle, two glass vials and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Turbidity *	NTU	-	0.1	9.6	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2130 B	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Chainusorn Lertnanthakunchai , Pattarapol Sawangjaitam

Remark :
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Sawitree Noisangjam
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ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2436210
Date Received : Apr 09, 2024
Date Reported : Apr 20, 2024
Report Number : 2968171-1

Sample Number	2436210-1
Sampled Date	Apr 09, 2024 2:17 PM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Apr 09, 2024
Condition of Sample	Contained in one amber glass bottle, one BOD bottle and six plastic bottles.sample containers comply to pretreatment - preservation standards (APHA/USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	<25	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C				8.1	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Residual Free Chlorine *	mg/L	-	0.1	<0.1	≤1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Cl (F)	Rayong
Temperature *	Degree C	-	-	34.3	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	222	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	2.5	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	3	<3	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Technical Management N.Banchongkit
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-ง-9445

Approved by D.Changchon
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-9442

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2436210
Date Received : Apr 09, 2024
Date Reported : Apr 20, 2024
Report Number : 2968171-1

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Chainusorn Lertnanthakunchai ทะเบียนเลขที่ ว-323-ง-9461 , Pattarapol Sawangjaitam ทะเบียนเลขที่ ว-204-ง-0002

Remark :
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- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management N.Banchongkit
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-ง-9445

Approved by D.Changchon
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-9442

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Analysis / Test Report

TESTING
No.0009

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2436210
Date Received : Apr 09, 2024
Date Reported : Apr 20, 2024
Report Number : 2968171-2

Sample Number	2436210-1
Sampled Date	Apr 09, 2024 2:17 PM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Apr 10, 2024
Condition of Sample	Contained in one amber glass bottle, one BOD bottle and six plastic bottles.sample containers comply to pretreatment - preservation standards (APHA/USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/L	0.0003	0.0005	0.04	≤2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Chainusorn Lertnanthakunchai ทะเบียนเลขที่ ว-323-ง-9461 , Pattarapol Sawangjaitam ทะเบียนเลขที่ ว-204-ง-0002

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management Chanatt L.
Chanattagarn Imchom
Section Head
ทะเบียนเลขที่ ว-204-ง-0008

Approved by Kanokkorn Anek
Kanokkorn Anek
Senior Manager
ทะเบียนเลขที่ ว-204-ก-0004

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Analysis / Test Report

TESTING
No.0009

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2436210
Date Received : Apr 09, 2024
Date Reported : Apr 20, 2024
Report Number : 2968171-3

Sample Number	2436210-1
Sampled Date	Apr 09, 2024 2:17 PM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Apr 09, 2024
Condition of Sample	Contained in one amber glass bottle, one BOD bottle and six plastic bottles.sample containers comply to pretreatment - preservation standards (APHA/USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Iron	mg/L	0.003	0.005	0.77	≤10.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok
Water Testing							
Calcium Hardness as CaCO3 *	mg/L	-	1	52	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3500-Ca (B)	Bangkok
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	386	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2510 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	7.0	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-O (C)	Rayong
Flow rate *	m3/s	-	-	0.004	No Standard	Flow meter	Rayong
Nitrate as N *	mg/L	0.015	0.05	0.77	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-NO3 (E)	Rayong
Silica as SiO2 *	mg/L	0.2	0.5	12.6	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SiO2 (C)	Rayong
Total Alkalinity as CaCO3 *	mg/L	1	1	87	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2320 B	Rayong
Total Hardness as CaCO3 *	mg/L	-	1	91	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2340 C	Rayong

Approved by Chanatt L.
Chanattagarn Imchom
Section Head

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Analysis / Test Report

TESTING
No.0009

Lot ID: 2436210

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location: CUP 4

Date Received : Apr 09, 2024
Date Reported : Apr 20, 2024
Report Number : 2968171-3

Sample Number	2436210-1
Sampled Date	Apr 09, 2024 2:17 PM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Apr 09, 2024
Condition of Sample	Contained in one amber glass bottle, one BOD bottle and six plastic bottles.sample containers comply to pretreatment - preservation standards (APHA/USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Turbidity *	NTU	-	0.1	11.0	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2130 B	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Chainusorn Lertnanthakunchai , Pattarapol Sawangjaitam

Remark :
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- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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Approved by
Chanattagarn Imchom
Section Head

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Analysis / Test Report

TESTING
No.0042

Lot ID: 2447645

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : May 14, 2024
Date Reported : May 23, 2024
Report Number : 3000921-1

Sample Number	2447645-1
Sampled Date	May 14, 2024 2:27 PM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	May 14, 2024
Condition of Sample	Contained in one BOD bottle, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	<25	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C		-	-	7.7	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Residual Free Chlorine *	mg/L	-	0.1	<0.1	≤1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Cl (F)	Rayong
Temperature *	Degree C	-	-	33.8	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	87	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	<1.0	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Technical Management
Chonticha Subongkoch
Scientist (3)
ทะเบียนเลขที่ ว-323-ง-9449

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ง-9442

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Analysis / Test Report

TESTING
No.0042

Lot ID: 2447645

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : May 14, 2024
Date Reported : May 23, 2024
Report Number : 3000921-1

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Chainusorn Lertnanthakunchai ทะเบียนเลขที่ ว-323-ง-9461 , Samart Khumphlee ทะเบียนเลขที่ ว-204-ง-0084

Remark :
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- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management
Chonticha Subongkoch
Scientist (3)
ทะเบียนเลขที่ ว-323-ง-9449

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ง-9442

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Analysis / Test Report

TESTING
No.0009

Lot ID: 2447645

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : May 14, 2024
Date Reported : May 23, 2024
Report Number : 3000921-2

Sample Number	2447645-1
Sampled Date	May 14, 2024 2:27 PM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	May 15, 2024
Condition of Sample	Contained in one BOD bottle, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/L	0.0003	0.0005	0.04	≤2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Chainusorn Lertnanthakunchai ทะเบียนเลขที่ ว-323-ง-9461 , Samart Khumphlee ทะเบียนเลขที่ ว-204-ง-0084

Remark :
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Technical Management
Sawitree Noisangiam
Manager
ทะเบียนเลขที่ ว-204-ง-0007

Approved by
Kanokkorn Anek
Senior Manager
ทะเบียนเลขที่ ว-204-ง-0004

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Analysis / Test Report

TESTING
No.0009

Lot ID: 2447645

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : May 14, 2024
Date Reported : May 23, 2024
Report Number : 3000921-3

Sample Number 2447645-1
Sampled Date May 14, 2024 2:27 PM
Sample Description Wastewater
Location Holding pond 320 m3
Date Analysis Commenced May 14, 2024
Condition of Sample Contained in one BOD bottle, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Iron	mg/L	0.003	0.005	0.58	≤10.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok
Water Testing							
Calcium Hardness as CaCO3 *	mg/L	-	1	9	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3500-Ca (B)	Bangkok
Coriductivity at 25 Degree C *	micromhos/cm	-	0.5	124	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2510 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	7.6	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-O (C)	Rayong
Flow rate *	m3/s	-	-	0.000	No Standard	Flow meter	Rayong
Nitrate as N *	mg/L	0.015	0.05	0.52	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-NO3 (E)	Rayong
Silica as SiO2 *	mg/L	0.2	0.5	2.7	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SiO2 (C)	Rayong
Total Alkalinity as CaCO3 *	mg/L	1	1	35	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2320 B	Rayong
Total Hardness as CaCO3 *	mg/L	-	1	26	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2340 C	Rayong

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Approved by Sawitree N.
Sawitree Noisangiam
Manager

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Analysis / Test Report

TESTING
No.0009

Lot ID: 2447645

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : May 14, 2024
Date Reported : May 23, 2024
Report Number : 3000921-3

Sample Number 2447645-1
Sampled Date May 14, 2024 2:27 PM
Sample Description Wastewater
Location Holding pond 320 m3
Date Analysis Commenced May 14, 2024
Condition of Sample Contained in one BOD bottle, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Turbidity *	NTU	-	0.1	5.6	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2130 B	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Chainusorn Lertnanthakunchai , Samart Khumphlee

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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Approved by Sawitree N.
Sawitree Noisangiam
Manager

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Analysis / Test Report

TESTING
No.0042

Lot ID: 2451929

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Jun 11, 2024
Date Reported : Jun 19, 2024
Report Number : 3029266-1

Sample Number 2451929-1
Sampled Date Jun 11, 2024 2:30 PM
Sample Description Wastewater
Location Holding pond 320 m3
Date Analysis Commenced Jun 11, 2024
Condition of Sample Contained in two BOD bottles, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	<25	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C	-	-	-	7.4	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Residual Free Chlorine *	mg/L	-	0.1	<0.1	≤1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Cl (F)	Rayong
Temperature *	Degree C	-	-	30.8	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	63	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	1.0	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Technical Management Photchana S.
Photchana Seeda
Scientist (4)
ทะเบียนเลขที่ ว-323-ง-9446

Approved by Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-9442

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Analysis / Test Report

TESTING
No.0042

Lot ID: 2451929

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Jun 11, 2024
Date Reported : Jun 19, 2024
Report Number : 3029266-1

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Chainusorn Lertnanthakunchai ทะเบียนเลขที่ ว-323-ง-9461 , Pattaiapol Sawangjaitam ทะเบียนเลขที่ ว-204-ง-0002

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management Photchana S.
Photchana Seeda
Scientist (4)
ทะเบียนเลขที่ ว-323-ง-9446

Approved by Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-9442

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Analysis / Test Report

TESTING
No.0009

Lot ID: 2451929

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Date Received : Jun 11, 2024
Date Reported : Jun 19, 2024
Report Number : 3029268-2

Sample Number	2451929-1
Sampled Date	Jun 11, 2024 2:30 PM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Jun 12, 2024
Condition of Sample	Contained in two BOD bottles, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/L	0.0003	0.0005	0.43	≤2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Chainusorn Lertnanthakunchai ทะเบียนเลขที่ ว-323-ง-9461 , Pattarapol Sawangjaitam ทะเบียนเลขที่ ว-204-ง-0002

Remark :
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Technical Management
Sawitree Nolsangiam
Manager
ทะเบียนเลขที่ ว-204-ง-0007

Approved by
Kanokkorn Anek
Senior Manager
ทะเบียนเลขที่ ว-204-ง-0004

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Analysis / Test Report

TESTING
No.0009

Lot ID: 2451929

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Date Received : Jun 11, 2024
Date Reported : Jun 19, 2024
Report Number : 3029268-3

Sample Number	2451929-1
Sampled Date	Jun 11, 2024 2:30 PM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Jun 11, 2024
Condition of Sample	Contained in two BOD bottles, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Iron	mg/L	0.003	0.005	0.79	≤10.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok
Water Testing							
Calcium Hardness as CaCO3 *	mg/L	-	1	14	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3500-Ca (B)	Bangkok
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	121	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2510 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	8.1	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-O (C)	Rayong
Flow rate *	m3/s	-	-	0.000	No Standard	Flow meter	Rayong
Nitrate as N *	mg/L	0.015	0.05	0.38	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-NO3 (E)	Rayong
Silica as SiO2 *	mg/L	0.2	0.5	3.7	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SiO2 (C)	Rayong
Total Alkalinity as CaCO3 *	mg/L	1	1	53	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2320 B	Rayong
Total Hardness as CaCO3 *	mg/L	-	1	24	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2340 C	Rayong

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Approved by
Chanattagarn Imchom
Section Head

Analysis / Test Report

TESTING
No.0009

Lot ID: 2451929

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Date Received : Jun 11, 2024
Date Reported : Jun 19, 2024
Report Number : 3029268-3

Sample Number	2451929-1
Sampled Date	Jun 11, 2024 2:30 PM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Jun 11, 2024
Condition of Sample	Contained in two BOD bottles, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Turbidity *	NTU	-	0.1	2.7	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2130 B	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Chainusorn Lertnanthakunchai , Pattarapol Sawangjaitam

Remark :
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Chanattagarn Imchom
Section Head

Analysis / Test Report

TESTING
No.0042

Lot ID: 23147571

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Date Received : Jan 09, 2024
Date Reported : Jan 17, 2024
Report Number : 2567601-1

Sample Number	23147571-2
Sampled Date	Jan 09, 2024 2:15 PM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Jan 09, 2024
Condition of Sample	Contained in one amber glass bottle, two glass vials and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	43	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C		-	-	8.3	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	30.7	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	640	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	1.5	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Pattarapol Sawangjaitam ทะเบียนเลขที่ ว-204-ง-0002

Technical Management
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-ง-9445

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ง-9442

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Analysis / Test Report

TESTING
No.0042

Lot ID: 23147571

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location: CUP 4

Date Received : Jan 09, 2024
Date Reported : Jan 17, 2024
Report Number : 2887601-1

Remark :
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Technical Management
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-ง-9445

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ง-9442

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Analysis / Test Report

TESTING
No.0009

Lot ID: 23147571

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location: CUP 4

Date Received : Jan 09, 2024
Date Reported : Jan 17, 2024
Report Number : 2887601-2

Sample Number	23147571-2
Sampled Date	Jan 09, 2024 2:15 PM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Jan 10, 2024
Condition of Sample	Contained in one amber glass bottle, two glass vials and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/L	0.0003	0.0005	0.002	≤2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Pattarapol Sawangjaitam ทะเบียนเลขที่ ว-204-ง-0002

Remark :
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Technical Management
Sawitree Noisangjam
Manager
ทะเบียนเลขที่ ว-204-ง-4709

Approved by
Kanokkorn Anek
Senior Manager
ทะเบียนเลขที่ ว-204-ง-6111

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Analysis / Test Report

TESTING
No.0009

Lot ID: 23147571

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location: CUP 4

Date Received : Jan 09, 2024
Date Reported : Jan 17, 2024
Report Number : 2887601-3

Sample Number	23147571-2
Sampled Date	Jan 09, 2024 2:15 PM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Jan 10, 2024
Condition of Sample	Contained in one amber glass bottle, two glass vials and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Iron	mg/L	0.003	0.005	0.02	≤10.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok
Volatile Organics Compounds							
Bromodichloromethane *	ug/L	0.2	0.5	Not Detected	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Bromoform *	ug/L	0.2	0.5	Not Detected	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Chloroform *	ug/L	0.2	0.5	3.3	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Dibromochloromethane *	ug/L	0.2	0.5	Not Detected	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Total Trihalomethanes *	ug/L	0.2	1	3.3	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Water Testing							
Calcium Hardness as CaCO3 *	mg/L	-	1	178	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3500-Ca (B)	Bangkok
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	1084	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2510 B	Rayong

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Approved by
Siriluk Puengpang
Section Head

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Analysis / Test Report

TESTING
No.0009

Lot ID: 23147571

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location: CUP 4

Date Received : Jan 09, 2024
Date Reported : Jan 17, 2024
Report Number : 2887601-3

Sample Number	23147571-2
Sampled Date	Jan 09, 2024 2:15 PM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Jan 10, 2024
Condition of Sample	Contained in one amber glass bottle, two glass vials and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Nitrate as N *	mg/L	0.015	0.05	1.61	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-NO3 (E)	Rayong
Silica as SiO2 *	mg/L	0.2	0.5	32.4	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SiO2 (C)	Rayong
Total Alkalinity as CaCO3 *	mg/L	1	1	275	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2320 B	Rayong
Total Hardness as CaCO3 *	mg/L	-	1	274	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2340 C	Rayong
Turbidity *	NTU	-	0.1	0.6	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2130 B	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Pattarapol Sawangjaitam

Remark :
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Siriluk Puengpang
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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Lot ID: 2412708
Date Received : Feb 13, 2024
Date Reported : Feb 21, 2024
Report Number : 2917215-1

Sample Number 2412708-2
Sampled Date Feb 13, 2024 2:15 PM
Sample Description Wastewater
Location Holding pond 1800 m3
Date Analysis Commenced Feb 13, 2024
Condition of Sample Contained in one amber glass bottle, one BOD bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	32	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C	-	-	-	8.3	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	30.7	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	676	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	1.9	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Chainusorn Lertnanthakunchai หมายเลขที่ ว-323-ง-9461 , Pattarapol Sawangjaitam หมายเลขที่ ว-204-ง-0002

Technical Management
Narumon Banchongkit
Supervisor
หมายเลขที่ ว-323-ง-9445

Approved by
Dej Changchon
Senior Manager
หมายเลขที่ ว-323-ง-9442

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Lot ID: 2412708
Date Received : Feb 13, 2024
Date Reported : Feb 21, 2024
Report Number : 2917215-1

Remark :
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Technical Management
Narumon Banchongkit
Supervisor
หมายเลขที่ ว-323-ง-9445

Approved by
Dej Changchon
Senior Manager
หมายเลขที่ ว-323-ง-9442

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Analysis / Test Report

TESTING
No.0009

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Lot ID: 2412708
Date Received : Feb 13, 2024
Date Reported : Feb 21, 2024
Report Number : 2917215-2

Sample Number 2412708-2
Sampled Date Feb 13, 2024 2:15 PM
Sample Description Wastewater
Location Holding pond 1800 m3
Date Analysis Commenced Feb 14, 2024
Condition of Sample Contained in one amber glass bottle, one BOD bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/L	0.0003	0.0005	0.001	≤2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Chainusorn Lertnanthakunchai หมายเลขที่ ว-323-ง-9461 , Pattarapol Sawangjaitam หมายเลขที่ ว-204-ง-0002

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management
Sawitree Noisangjam
Manager
หมายเลขที่ ว-204-ง-4709

Approved by
Kanokkorn Anek
Senior Manager
หมายเลขที่ ว-204-ง-6111

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ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Analysis / Test Report

TESTING
No.0009

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Lot ID: 2412708
Date Received : Feb 13, 2024
Date Reported : Feb 21, 2024
Report Number : 2917215-3

Sample Number 2412708-2
Sampled Date Feb 13, 2024 2:15 PM
Sample Description Wastewater
Location Holding pond 1800 m3
Date Analysis Commenced Feb 14, 2024
Condition of Sample Contained in one amber glass bottle, one BOD bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Iron	mg/L	0.003	0.005	0.02	≤10.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok
Volatile Organics Compounds							
Bromodichloromethane *	ug/L	0.2	0.5	1.2	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Bromoform *	ug/L	0.2	0.5	Not Detected	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Chloroform *	ug/L	0.2	0.5	2.8	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Dibromochloromethane *	ug/L	0.2	0.5	0.8	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Total Trihalomethanes *	ug/L	0.2	1	4.7	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Water Testing							
Calcium Hardness as CaCO3 *	mg/L	-	1	175	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3500-Ca (B)	Bangkok
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	1031	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2510 B	Rayong

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Approved by
Sawitree Noisangjam
Manager

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Analysis / Test Report

TESTING
No.0009

Lot ID: 2412708

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Feb 13, 2024
Date Reported : Feb 21, 2024
Report Number : 2917215-3

Sample Number	2412708-2
Sampled Date	Feb 13, 2024 2:15 PM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Feb 14, 2024
Condition of Sample	Contained in one amber glass bottle, one BOD bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Nitrate as N *	mg/L	0.015	0.05	1.05	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-NO3 (E)	Rayong
Silica as SiO2 *	mg/L	0.2	0.5	33.7	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SiO2 (C)	Rayong
Total Alkalinity as CaCO3 *	mg/L	1	1	275	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2320 B	Rayong
Total Hardness as CaCO3 *	mg/L	-	1	286	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2340 C	Rayong
Turbidity *	NTU	-	0.1	0.7	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2130 B	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Chainusorn Lertnanthakunchai , Pattarapol Sawangjaitam

Remark :
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Approved by
Sawitree N.
Sawitree Noisangiam
Manager

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ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Analysis / Test Report

TESTING
No.0042

Lot ID: 2425981

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location: CUP 4

Date Received : Mar 12, 2024
Date Reported : Mar 20, 2024
Report Number : 2942239-1

Sample Number	2425981-2
Sampled Date	Mar 12, 2024 2:25 PM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Mar 12, 2024
Condition of Sample	Contained in one amber glass bottle, two glass vials and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	34	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C	-	-	-	8.3	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	30.0	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	664	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	1.8	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Chainusorn Lertnanthakunchai หมายเลขที่ ว-323-ง-9461 , Pattarapol Sawangjaitam หมายเลขที่ ว-204-ง-0002

Technical Management
Narumon Banchongkit
Supervisor
หมายเลขที่ ว-323-ง-9445

Approved by
Dej Changchon
Senior Manager
หมายเลขที่ ว-323-ง-9442

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report may be reproduced in any form without written consent from the laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

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ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Analysis / Test Report

TESTING
No.0042

Lot ID: 2425981

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location: CUP 4

Date Received : Mar 12, 2024
Date Reported : Mar 20, 2024
Report Number : 2942239-1

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management
Narumon Banchongkit
Supervisor
หมายเลขที่ ว-323-ง-9445

Approved by
Dej Changchon
Senior Manager
หมายเลขที่ ว-323-ง-9442

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Analysis / Test Report

TESTING
No.0009

Lot ID: 2425981

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location: CUP 4

Date Received : Mar 12, 2024
Date Reported : Mar 20, 2024
Report Number : 2942239-2

Sample Number	2425981-2
Sampled Date	Mar 12, 2024 2:25 PM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Mar 13, 2024
Condition of Sample	Contained in one amber glass bottle, two glass vials and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/L	0.0003	0.0005	0.001	≤2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Chainusorn Lertnanthakunchai หมายเลขที่ ว-323-ง-9461 , Pattarapol Sawangjaitam หมายเลขที่ ว-204-ง-0002

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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Technical Management
Sawitree Noisangiam
Manager
หมายเลขที่ ว-204-ง-0007

Approved by
Kanokkorn Anek
Senior Manager
หมายเลขที่ ว-204-ง-0004

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ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Analysis / Test Report

TESTING
No.0009

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425981
Date Received : Mar 12, 2024
Date Reported : Mar 20, 2024
Report Number : 2942239-3

Sample Number	2425981-2
Sampled Date	Mar 12, 2024 2:25 PM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Mar 13, 2024
Condition of Sample	Contained in one amber glass bottle, two glass vials and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Iron	mg/L	0.003	0.005	0.02	≤10.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok
Volatile Organics Compounds							
Bromodichloromethane *	ug/L	0.2	0.5	Not Detected	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Bromoform *	ug/L	0.2	0.5	Not Detected	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Chloroform *	ug/L	0.2	0.5	Not Detected	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Dibromochloromethane *	ug/L	0.2	0.5	Not Detected	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Total Trihalomethanes *	ug/L	0.2	1	Not Detected	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Water Testing							
Calcium Hardness as CaCO3 *	mg/L	-	1	158	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3500-Ca (B)	Bangkok
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	953	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2510 B	Rayong

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Approved by
Sawitree Noisangiam
Manager

Analysis / Test Report

TESTING
No.0009

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425981
Date Received : Mar 12, 2024
Date Reported : Mar 20, 2024
Report Number : 2942239-3

Sample Number	2425981-2
Sampled Date	Mar 12, 2024 2:25 PM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Mar 13, 2024
Condition of Sample	Contained in one amber glass bottle, two glass vials and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Nitrate as N *	mg/L	0.015	0.05	1.50	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-NO3 (E)	Rayong
Silica as SiO2 *	mg/L	0.2	0.5	34.1	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SiO2 (C)	Rayong
Total Alkalinity as CaCO3 *	mg/L	1	1	256	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2320 B	Rayong
Total Hardness as CaCO3 *	mg/L	-	1	214	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2340 C	Rayong
Turbidity *	NTU	-	0.1	0.9	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2130 B	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Chainusorn Lertnanthakunchai , Pattarapol Sawangjaitam

Remark :
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Sawitree Noisangiam
Manager

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2436210
Date Received : Apr 09, 2024
Date Reported : Apr 20, 2024
Report Number : 2968172-1

Sample Number	2436210-2
Sampled Date	Apr 09, 2024 2:05 PM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Apr 09, 2024
Condition of Sample	Contained in two glass vials, one amber glass bottle, one BOD bottle and six plastic bottles.sample containers comply to pretreatment - preservation standards (APHA/USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	33	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C	-	-	-	8.4	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	33.3	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	648	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	1.5	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Chainusorn Lertnanthakunchai หมายเลขที่ ว-323-จ-9461 , Pattarapol Sawangjaitam หมายเลขที่ ว-204-จ-0002

Technical Management
Narumon Banchongkit
Supervisor
หมายเลขที่ ว-323-จ-9445

Approved by
Dej Changchon
Senior Manager
หมายเลขที่ ว-323-จ-9442

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2436210
Date Received : Apr 09, 2024
Date Reported : Apr 20, 2024
Report Number : 2968172-1

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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Technical Management
Narumon Banchongkit
Supervisor
หมายเลขที่ ว-323-จ-9445

Approved by
Dej Changchon
Senior Manager
หมายเลขที่ ว-323-จ-9442

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Analysis / Test Report

TESTING
No.0009

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2436210
Date Received : Apr 09, 2024
Date Reported : Apr 20, 2024
Report Number : 2968172-2

Sample Number	2436210-2
Sampled Date	Apr 09, 2024 2:05 PM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Apr 09, 2024
Condition of Sample	Contained in two glass vials, one amber glass bottle, one BOD bottle and six plastic bottles.sample containers comply to pretreatment - preservation standards (APHA/USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Iron	mg/L	0.003	0.005	0.05	≤10.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok
Volatile Organics Compounds							
Bromodichloromethane *	ug/L	0.2	0.5	Not Detected	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Bromoform *	ug/L	0.2	0.5	Not Detected	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Chloroform *	ug/L	0.2	0.5	12.5	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Dibromochloromethane *	ug/L	0.2	0.5	Not Detected	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Total Trihalomethanes *	ug/L	0.2	1	12.5	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Water Testing							
Calcium Hardness as CaCO3 *	mg/L	-	1	184	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3500-Ca (B)	Bangkok
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	1075	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2510 B	Rayong

Approved by
Chanattagarn Imchom
Section Head

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Analysis / Test Report

TESTING
No.0009

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2436210
Date Received : Apr 09, 2024
Date Reported : Apr 20, 2024
Report Number : 2968172-2

Sample Number	2436210-2
Sampled Date	Apr 09, 2024 2:05 PM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Apr 09, 2024
Condition of Sample	Contained in two glass vials, one amber glass bottle, one BOD bottle and six plastic bottles.sample containers comply to pretreatment - preservation standards (APHA/USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Nitrate as N *	mg/L	0.015	0.05	1.17	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-NO3 (E)	Rayong
Silica as SiO2 *	mg/L	0.2	0.5	35.7	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SiO2 (C)	Rayong
Total Alkalinity as CaCO3 *	mg/L	1	1	300	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2320 B	Rayong
Total Hardness as CaCO3 *	mg/L	-	1	257	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2340 C	Rayong
Turbidity *	NTU	-	0.1	0.6	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2130 B	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Chainusorn Lertnanthakunchai , Pattarapol Sawangjaitam

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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Approved by
Chanattagarn Imchom
Section Head

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Analysis / Test Report

TESTING
No.0009

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2436210
Date Received : Apr 09, 2024
Date Reported : Apr 20, 2024
Report Number : 2968172-3

Sample Number	2436210-2
Sampled Date	Apr 09, 2024 2:05 PM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Apr 10, 2024
Condition of Sample	Contained in two glass vials, one amber glass bottle, one BOD bottle and six plastic bottles.sample containers comply to pretreatment - preservation standards (APHA/USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/L	0.0003	0.0005	0.001	≤2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok

Guideline : Notification of the Industrial Estate Authority of Thailand No.74, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Chainusorn Lertnanthakunchai หมายเลขที่ ว-323-ง-9461 , Pattarapol Sawangjaitam หมายเลขที่ ว-204-ง-0002

Remark :
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Technical Management
Chanattagarn Imchom
Section Head
หมายเลขที่ ว-204-ง-0008

Approved by
Kanokkorn Anek
Senior Manager
หมายเลขที่ ว-204-ง-0004

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2447645
Date Received : May 14, 2024
Date Reported : May 23, 2024
Report Number : 3000922-1

Sample Number	2447645-2
Sampled Date	May 14, 2024 2:15 PM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	May 14, 2024
Condition of Sample	Contained in one BOD bottle, one amber glass bottle and six plastic bottles. sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	47	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C	-	-	-	8.3	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	33.1	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	740	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	<1.0	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Chainusorn Lertnanthakunchai หมายเลขที่ ว-323-ง-9461 , Samart Khumphlee หมายเลขที่ ว-204-ง-0084

Technical Management
Chonticha Subongkoch
Scientist (3)
หมายเลขที่ ว-323-ง-9449

Approved by
Dej Changchon
Senior Manager
หมายเลขที่ ว-323-ง-9442

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Lot ID: 2447645
Date Received : May 14, 2024
Date Reported : May 23, 2024
Report Number : 3000922-1

Remark :
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Technical Management Chontichok
Chontiche Subongkoch
Scientist (3)
ทะเบียนเลขที่ ว-323-ง-9449

Approved by Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-9442

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Analysis / Test Report

TESTING
No.0009

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Lot ID: 2447645
Date Received : May 14, 2024
Date Reported : May 23, 2024
Report Number : 3000922-2

Sample Number 2447645-2
Sampled Date May 14, 2024 2:15 PM
Sample Description Wastewater
Location Holding pond 1800 m3
Date Analysis Commenced May 15, 2024
Condition of Sample Contained in one BOD bottle, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/L	0.0003	0.0005	0.002	≤2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Chainusorn Lertnanthakunchai ทะเบียนเลขที่ ว-323-ง-9461 , Samat Khumphlee ทะเบียนเลขที่ ว-204-ง-0084

Remark :
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Technical Management Sawitree N.
Sawitree Noisangiam
Manager
ทะเบียนเลขที่ ว-204-ง-0007

Approved by Kanokkorn Anek
Senior Manager
ทะเบียนเลขที่ ว-204-ก-0004

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Lot ID: 2447645
Date Received : May 14, 2024
Date Reported : May 23, 2024
Report Number : 3000922-3

Sample Number 2447645-2
Sampled Date May 14, 2024 2:15 PM
Sample Description Wastewater
Location Holding pond 1800 m3
Date Analysis Commenced May 15, 2024
Condition of Sample Contained in one BOD bottle, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Iron	mg/L	0.003	0.005	0.02	≤10.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok
Volatile Organics Compounds							
Bromodichloromethane *	ug/L	0.2	0.5	Not Detected	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Bromoform *	ug/L	0.2	0.5	Not Detected	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Chloroform *	ug/L	0.2	0.5	5.7	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Dibromochloromethane *	ug/L	0.2	0.5	Not Detected	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Total Trihalomethanes *	ug/L	0.2	1	5.7	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Water Testing							
Calcium Hardness as CaCO3 *	mg/L	-	1	172	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3500-Ca (B)	Bangkok
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	1156	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2510 B	Rayong

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Approved by Sawitree N.
Sawitree Noisangiam
Manager

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Lot ID: 2447645
Date Received : May 14, 2024
Date Reported : May 23, 2024
Report Number : 3000922-3

Sample Number 2447645-2
Sampled Date May 14, 2024 2:15 PM
Sample Description Wastewater
Location Holding pond 1800 m3
Date Analysis Commenced May 15, 2024
Condition of Sample Contained in one BOD bottle, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Nitrate as N *	mg/L	0.015	0.05	1.98	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-NO3 (E)	Rayong
Silica as SiO2 *	mg/L	0.2	0.5	33.0	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SiO2 (C)	Rayong
Total Alkalinity as CaCO3 *	mg/L	1	1	257	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2320 B	Rayong
Total Hardness as CaCO3 *	mg/L	-	1	270	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2340 C	Rayong
Turbidity *	NTU	-	0.1	0.8	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2130 B	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Chainusorn Lertnanthakunchai , Samart Khumphlee

Remark :
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Approved by Sawitree N.
Sawitree Noisangiam
Manager

Analysis / Test Report

TESTING
No.0042

Lot ID: 2451929

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Jun 11, 2024
Date Reported : Jun 19, 2024
Report Number : 3029269-1

Sample Number	2451929-2
Sampled Date	Jun 11, 2024 10:15 AM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Jun 11, 2024
Condition of Sample	Contained in two BOD bottles, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	30	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C	-	-	-	8.2	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	31.5	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	468	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	1.9	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Chainusorn Lertnanthakunchai ทะเบียนเลขที่ ว-323-ง-9461 , Pattarapol Sawangjaitam ทะเบียนเลขที่ ว-204-ง-0002

Technical Management Photchana S.
Photchana Seeda
Scientist (4)
ทะเบียนเลขที่ ว-323-ง-9446

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ง-9442

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Analysis / Test Report

TESTING
No.0042

Lot ID: 2451929

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Jun 11, 2024
Date Reported : Jun 19, 2024
Report Number : 3029269-1

Remark :
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Technical Management Photchana S.
Photchana Seeda
Scientist (4)
ทะเบียนเลขที่ ว-323-ง-9446

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ง-9442

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Analysis / Test Report

TESTING
No.0009

Lot ID: 2451929

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Jun 11, 2024
Date Reported : Jun 19, 2024
Report Number : 3029269-2

Sample Number	2451929-2
Sampled Date	Jun 11, 2024 10:15 AM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Jun 12, 2024
Condition of Sample	Contained in two BOD bottles, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/L	0.0003	0.0005	0.002	≤2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Chainusorn Lertnanthakunchai ทะเบียนเลขที่ ว-323-ง-9461 , Pattarapol Sawangjaitam ทะเบียนเลขที่ ว-204-ง-0002

Remark :
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Technical Management Sawitree N.
Sawitree Noisangjam
Manager
ทะเบียนเลขที่ ว-204-ง-0007

Approved by Kanokkorn Anek
Kanokkorn Anek
Senior Manager
ทะเบียนเลขที่ ว-204-ง-0004

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Analysis / Test Report

TESTING
No.0009

Lot ID: 2451929

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Jun 11, 2024
Date Reported : Jun 19, 2024
Report Number : 3029269-3

Sample Number	2451929-2
Sampled Date	Jun 11, 2024 10:15 AM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Jun 12, 2024
Condition of Sample	Contained in two BOD bottles, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Iron	mg/L	0.003	0.005	0.01	≤10.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok
Volatile Organics Compounds							
Bromodichloromethane *	ug/L	0.2	0.5	Not Detected	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Bromoform *	ug/L	0.2	0.5	Not Detected	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Chloroform *	ug/L	0.2	0.5	4.4	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Dibromochloromethane *	ug/L	0.2	0.5	Not Detected	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Total Trihalomethanes *	ug/L	0.2	1	4.4	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Water Testing							
Calcium Hardness as CaCO3 *	mg/L	-	1	148	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3500-Ca (B)	Bangkok
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	799	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2510 B	Rayong

Approved by Chanattagarn Imchom
Chanattagarn Imchom
Section Head

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Analysis / Test Report

TESTING
No.0009

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2451929
Date Received : Jun 11, 2024
Date Reported : Jun 19, 2024
Report Number : 3029269-3

Sample Number	2451929-2
Sampled Date	Jun 11, 2024 10:15 AM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Jun 12, 2024
Condition of Sample	Contained in two BOD bottles, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Nitrate as N *	mg/L	0.015	0.05	1.34	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-NO3 (E)	Rayong
Silica as SiO2 *	mg/L	0.2	0.5	39.6	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SiO2 (C)	Rayong
Total Alkalinity as CaCO3 *	mg/L	1	1	226	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2320 B	Rayong
Total Hardness as CaCO3 *	mg/L	-	1	193	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2340 C	Rayong
Turbidity *	NTU	-	0.1	0.5	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2130 B	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Chainusorn Lertnanthakunchai , Pattarapol Sawangjaitam

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425979
Date Received : Mar 18, 2024
Date Reported : Mar 25, 2024
Report Number: 2927936-1

Sample Number	2425979-1
Parameter	Heat Stress (Sampling Time : 9.30 AM - 11.30 AM)
Measurement Date	Mar 18, 2024
Measurement by	Amnat Wongsakhen
Location	ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
GTG	120	29.4	27.1	35.1	33.9
Average (WBGT)		29.4			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:
1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
2. Ministerial Regulation on Prescribing of Standard for Administration and Management of Occupational Safety, Health and Environmentin relation to Heat,Light and Noise, B.E.2559

Technical Management
Supot Salamteh
Section Head

Approved by
Wichan Choonharat
Assistant Manager

Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425979
Date Received : Mar 18, 2024
Date Reported : Mar 25, 2024
Report Number: 2927936-1

Sample Number	2425979-2
Parameter	Heat Stress (Sampling Time : 9.30 AM - 11.30 AM)
Measurement Date	Mar 18, 2024
Measurement by	Amnat Wongsakhen
Location	ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
HRSG	120	29.3	27.8	32.9	32.6
Average (WBGT)		29.3			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:
1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
2. Ministerial Regulation on Prescribing of Standard for Administration and Management of Occupational Safety, Health and Environmentin relation to Heat,Light and Noise, B.E.2559

Technical Management
Supot Salamteh
Section Head

Approved by
Wichan Choonharat
Assistant Manager

Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425455
Date Received : Mar 21, 2024
Date Reported : Mar 25, 2024
Report Number : 2927925-1

Sample Number	2425455-1
Sampled Date	Mar 18, 2024
Sample Description	Noise dose
Location	FO#1 (Day)
Personal Sampling	คณศักษพงศ์ แก้วสกรี
Date Analysis Commenced	Mar 25, 2024

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Noise Dose (12 hrs.) (Calculated from Lavg)	08:00 AM - 08:00 PM	%	-	1	56.2	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
Noise Dose (8 hrs.)	08:00 AM - 08:00 PM	%	-	1	52.5	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (12 hrs.) (Calculated from Lavg)	08:00 AM - 08:00 PM	dB(A)	-	--	80.5	83*	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (8 hrs.)	08:00 AM - 08:00 PM	dB(A)	-	--	82.2	85	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong

Guideline :
MOL : 1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
2. Notification of Department of Labour Protection and Welfare on the Stancard of Time Weighted Average (TWA) Noise Level (B.E. 2561)
* MOL: Recommended guideline limit for 12 working hours should not be over 83 dB(A)
Sampled By : Amnat Wongsakhen

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425455
Date Received : Mar 21, 2024
Date Reported : Mar 25, 2024
Report Number : 2927925-1

Sample Number 2425455-2
Sampled Date Mar 18, 2024
Sample Description Noise dose
Location FO#1 (Night)
Personal Sampling คุณกาศัล แซ่เฮ็ง
Date Analysis Commenced Mar 25, 2024

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Noise Dose (12 hrs.) (Calculated from Lavg)	07:20 PM - 07:20 AM	%	-	:	<1	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
Noise Dose (8 hrs.)	07:20 PM - 07:20 AM	%	-	:	<1	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (12 hrs.) (Calculated from Lavg)	07:20 PM - 07:20 AM	dB(A)	-	-	59.2	83*	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (8 hrs.)	07:20 PM - 07:20 AM	dB(A)	-	-	60.9	85	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong

Guideline :
MOL : 1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
2. Notification of Department of Labour Protection and Welfare on the Standard of Time Weighted Average (TWA) Noise Level (B.E. 2561)
* MOL: Recommended guideline limit for 12 working hours should not be over 83 dB(A)
Sampled By : Amnat Wongsakhen

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425455
Date Received : Mar 21, 2024
Date Reported : Mar 25, 2024
Report Number : 2927925-1

Sample Number 2425455-3
Sampled Date Mar 18, 2024
Sample Description Noise dose
Location FO#2 (Day)
Personal Sampling คุณภูมิเรศ ดันหา
Date Analysis Commenced Mar 25, 2024

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Noise Dose (12 hrs.) (Calculated from Lavg)	08:00 AM - 08:00 PM	%	-	1	8.7	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
Noise Dose (8 hrs.)	08:00 AM - 08:00 PM	%	-	1	8.1	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (12 hrs.) (Calculated from Lavg)	08:00 AM - 08:00 PM	dB(A)	-	-	72.4	83*	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (8 hrs.)	08:00 AM - 08:00 PM	dB(A)	-	-	74.1	85	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong

Guideline :
MOL : 1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
2. Notification of Department of Labour Protection and Welfare on the Standard of Time Weighted Average (TWA) Noise Level (B.E. 2561)
* MOL: Recommended guideline limit for 12 working hours should not be over 83 dB(A)
Sampled By : Amnat Wongsakhen

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

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Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425455
Date Received : Mar 21, 2024
Date Reported : Mar 25, 2024
Report Number : 2927925-1

Sample Number 2425455-4
Sampled Date Mar 18, 2024
Sample Description Noise dose
Location FO#2 (Night)
Personal Sampling คุณรามัน เอลดั้น
Date Analysis Commenced Mar 25, 2024

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Noise Dose (12 hrs.) (Calculated from Lavg)	07:20 PM - 07:20 AM	%	-	:	4.5	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
Noise Dose (8 hrs.)	07:20 PM - 07:20 AM	%	-	:	4.2	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (12 hrs.) (Calculated from Lavg)	07:20 PM - 07:20 AM	dB(A)	-	-	69.5	83*	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (8 hrs.)	07:20 PM - 07:20 AM	dB(A)	-	-	71.2	85	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong

Guideline :
MOL : 1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
2. Notification of Department of Labour Protection and Welfare on the Standard of Time Weighted Average (TWA) Noise Level (B.E. 2561)
* MOL: Recommended guideline limit for 12 working hours should not be over 83 dB(A)
Sampled By : Amnat Wongsakhen

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O :
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2425455
Date Received : Mar 21, 2024
Date Reported : Mar 25, 2024
Report Number : 2927925-1

Sample Number 2425455-5
Sampled Date Mar 18, 2024
Sample Description Noise dose
Location CO#1 (Day)
Personal Sampling คณอธกฤต มั่งศิริทร
Date Analysis Commenced Mar 25, 2024

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Noise Dose (12 hrs.) (Calculated from Lavg)	08:00 AM - 08:00 PM	%	-	1	4.1	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
Noise Dose (8 hrs.)	08:00 AM - 08:00 PM	%	-	1	3.8	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (12 hrs.) (Calculated from Lavg)	08:00 AM - 08:00 PM	dB(A)	-	-	69.1	83*	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (8 hrs.)	08:00 AM - 08:00 PM	dB(A)	-	-	70.8	85	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong

Guideline :
MOL : 1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
2. Notification of Department of Labour Protection and Welfare on the Standard of Time Weighted Average (TWA) Noise Level (B.E. 2561)
* MOL: Recommended guideline limit for 12 working hours should not be over 83 dB(A)
Sampled By : Amnat Wongsakhen

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

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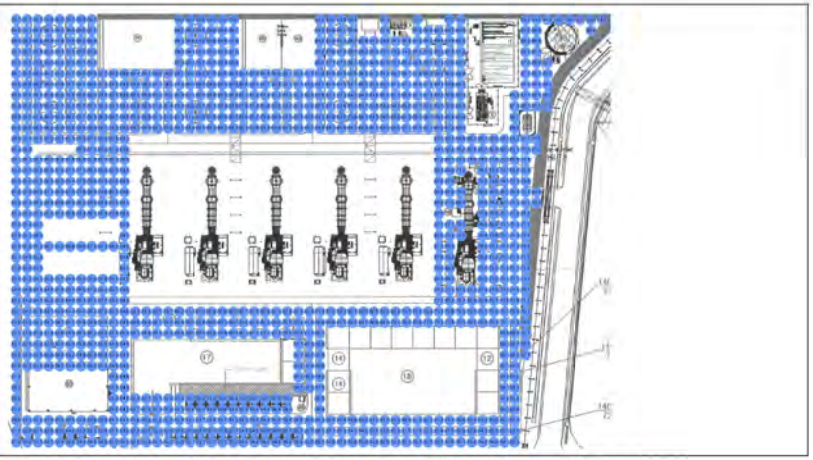
Noise Contour Map

Global Power Synergy Public Company Limited

พื้นที่โครงการ_กระบวนการผลิต

Reference Number : Lot 2425461-1

Measurement Date : Mar 20, 2024



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Bancharng, Banchang, Rayong 21130

P/O :
Project Name : Homboarng
Project Location : CUP 4

Lot ID: 2425455
Date Received : Mar 21, 2024
Date Reported : Mar 25, 2024
Report Number : 2527371

Page 1 of 1

Sample Number	2425455-6							
Sampled Date	Mar 18, 2024							
Sample Description	Noise close							
Location	CO#1 (Night)							
Personal Sampling	ตรวจวัดระดับเสียงบริเวณที่							
Date Analysis Commenced	Mar 25, 2024							
Analyte	**Sampled Date/Time**	**Unit**	**LOD**	**LOQ (LOR)**	**Result**	**Guideline Limit**	**Method**	**Guideline Testing Location**
Air Testing								
Noise Dose (12 hrs.) (Calculated from Leq)	07:20 PM - 07:20 AM	%	-	-	<1	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL Rayong
Noise Dose (8 hrs.)	07:20 PM - 07:20 AM	%	-	-	<1	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL Rayong
TWA (12 hrs.) (Calculated from Leq)	07:20 PM - 07:20 AM	dB(A)	-	-	48.0	83*	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL Rayong
TWA (8 hrs.)	07:20 PM - 07:20 AM	dB(A)	-	-	48.6	85	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL Rayong

Guideline :
MOL : 1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2551)
2. Notification of Department of Labour Protection and Welfare on the Standard of Time Weighted Average (TWA) Noise Level (B.E. 2561)
* MOL: Recommended guideline limit for 12 working hours should not be over 83 dB(A)

Sampled By : Anmart Wongsakhien

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantization) / LOR (Limit of Reporting)

Approved by

Supot Salamteh
Section Head

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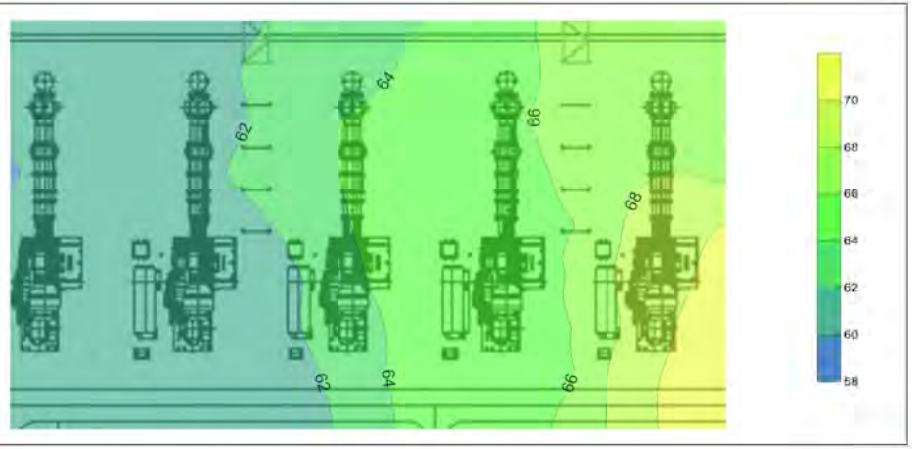
Noise Contour Map

Global Power Synergy Public Company Limited

พื้นที่โครงการ (พื้นที่ว่างเปล่า)

Reference Number : Lot 2425461-2

Measurement Date : Mar 20, 2024



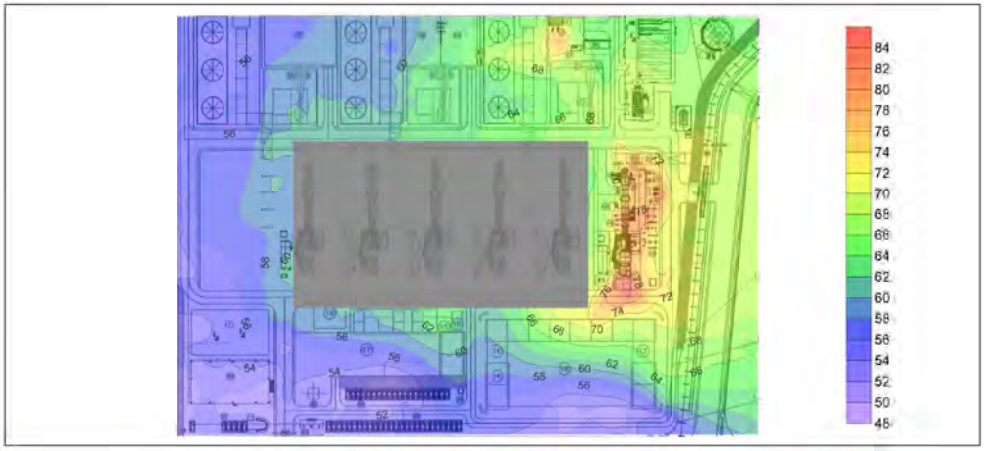
Noise Contour Map

Global Power Synergy Public Company Limited

พื้นที่โครงการ_กระบวนการผลิต

Reference Number : Lot 2425461-1

Measurement Date : Mar 20, 2024



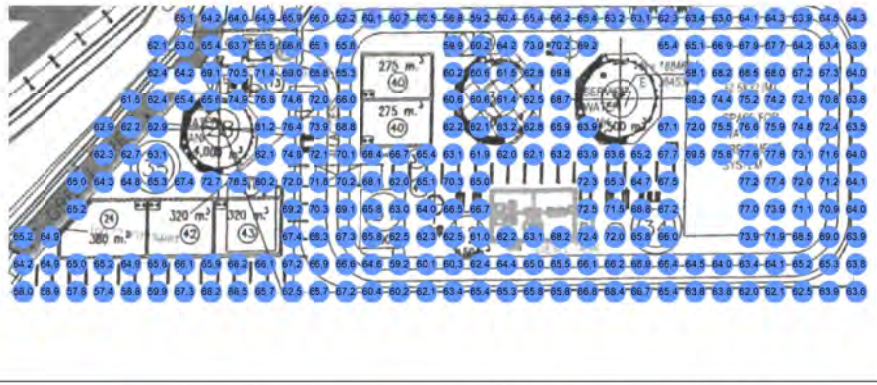
Noise Contour Map

Global Power Synergy Public Company Limited

พื้นที่โครงการ_โรงบำบัดน้ำ

Reference Number : Lot 2425461-3

Measurement Date : Mar 20, 2024



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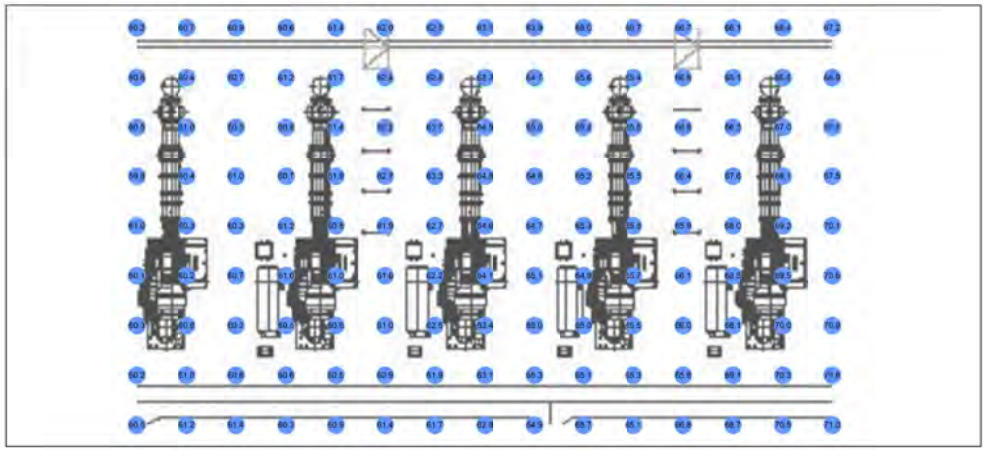
Noise Contour Map

Global Power Synergy Public Company Limited

พื้นที่โครงการ (พื้นที่ว่างเปล่า)

Reference Number : Lot 2425461-2

Measurement Date : Mar 20, 2024



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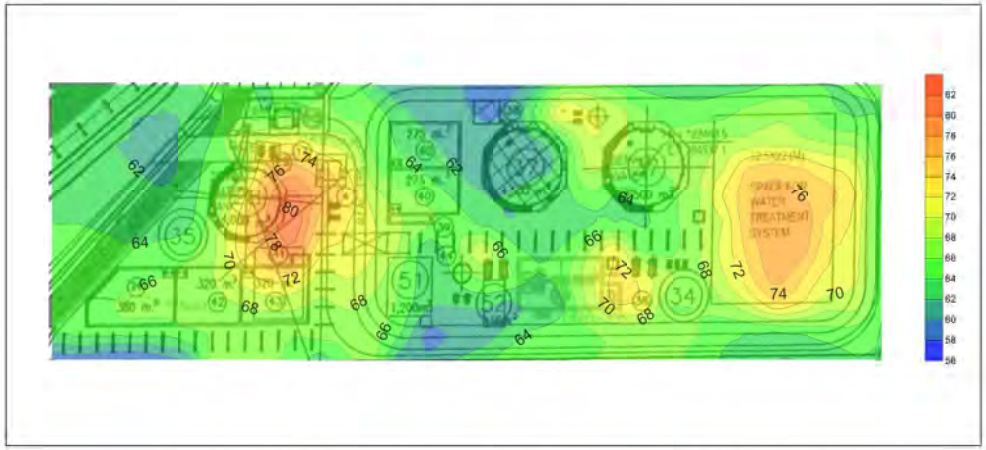
Noise Contour Map

Global Power Synergy Public Company Limited

พื้นที่โครงการ_โรงบำบัดน้ำ

Reference Number : Lot 2425461-3

Measurement Date : Mar 20, 2024



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รายการเครื่องมือที่ใช้ในการวิเคราะห์ / ตรวจสอบ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal.	Freq. Calibrate (Months)
Stack (CEMs)	Oxides of Nitrogen	Analyzer , System calibration, Stand				
Stack (CEMs)	Sulfur Dioxide	Analyzer , System calibration, Stand				
Stack	Total Suspended Particulate	Console Control Unit	RYG_FS0315	9-Jan-24	9-Jul-24	6
Stack	Total Suspended Particulate	Pitot Tube	RYG_FS0321	9-Jan-24	9-Jul-24	6
Stack	Total Suspended Particulate	Digital Balance	RYG_EN0003	22-Feb-24	22-Feb-25	12
Stack	Ammonia	Console Control Unit	RYG_FS0315	9-Jan-24	9-Jul-24	6
Stack	Ammonia	Pitot Tube	RYG_FS0321	9-Jan-24	9-Jul-24	6
Stack	Ammonia	Dry Gas	RYG_FS0317	9-Jan-24	9-Jul-24	6
Stack	Ammonia	SPECTROPHOTOMETER	RYG_EN0037	18-Sep-23	18-Mar-25	18
Ambient	Nitrogen Dioxide	NO_2 Analyzer	RYG_FS0272	4-Jan-24	4-Jul-24	6
Ambient	Nitrogen Dioxide	NO_2 Analyzer	RYG_FS0463	4-Jan-24	4-Jul-24	6
Ambient	Nitrogen Dioxide	NO_2 Analyzer	RYG_FS0551	4-Jan-24	4-Jul-24	6
Ambient	Nitrogen Dioxide	NO_2 Analyzer	RYG_FS0255	4-Jan-24	4-Jul-24	6
Ambient	Sulfur Dioxide	SO_2 Analyzer	RYG_FS0271	4-Jan-24	4-Jul-24	6
Ambient	Sulfur Dioxide	SO_2 Analyzer	RYG_FS0462	4-Jan-24	4-Jul-24	6
Ambient	Sulfur Dioxide	SO_2 Analyzer	RYG_FS0458	4-Jan-24	4-Jul-24	6
Ambient	Sulfur Dioxide	SO_2 Analyzer	RYG_FS0258	4-Jan-24	4-Jul-24	6
Ambient	Particulate Matter (PM-10)	High Volume	RYG_FS0186	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	High Volume	RYG_FS0192	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	High Volume	RYG_FS0189	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	High Volume	RYG_FS0667	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	Digital Balance	RYG_EN0001	22-Feb-24	22-Feb-25	12
Ambient	Total Suspended Particulate	High Volume	RYG_FS0173	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	RYG_FS0393	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	RYG_FS0662	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	RYG_FS0663	-	-	On site Calibration
Ambient	Total Suspended Particulate	Digital Balance	RYG_EN0001	22-Feb-24	22-Feb-25	12
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	RYG_FS0412	10-Feb-23	10-Aug-24	18
Noise	Leq 24 hrs	Sound Calibrator	RYG_FS0696	26-Jan-24	25-Jan-25	12
Noise	Leq 24 hrs	Sound Level Meter	RYG_FS0617	12-Jan-24	11-Jan-25	12
Noise	Leq 24 hrs	Sound Level Meter	RYG_FS0620	12-Jan-24	11-Jan-25	12
Noise	Noise Dose, TWA	Dose Badge Reader	RYG_FS0212	18-Aug-23	18-Aug-24	12
Heat	Heat Stress	Heat Stress Monitor	RYG_FS0217	8-Jan-24	7-Jan-25	12
Heat	Heat Stress	Heat Stress Monitor	RYG_FS0218	15-Feb-24	14-Feb-25	12
Rayong Lab	pH at 25 °C	pH meter	RYG_EN0183	19-Jan-24	19-Jan-25	12
Rayong Lab	BOD	DO meter with Sensor	RYG_EN0032	24-Jul-23	24-Jan-25	18
Rayong Lab	BOD	Incubator	RYG_EN0154	29-May-23	29-Nov-24	18
Rayong Lab	Total Dissolved Solids 180°C	Electronic Balance	RYG_EN0002	22-Feb-24	22-Feb-25	12
Rayong Lab	Total Dissolved Solids 180°C	Hot Air Oven	RYG_EN0010	21-Mar-24	21-Sep-25	18
Rayong Lab	Oil & Grease	Electronic Balance	RYG_EN0002	22-Feb-24	22-Feb-25	12
Rayong Lab	Oil & Grease	Hot Air Oven	RYG_EN0213	21-Mar-24	21-Mar-25	12
Rayong Lab	Oil & Grease	Water Bath	RYG_EN0061	21-Mar-23	21-Sep-25	18
Rayong Lab	Temperature	pH meter	RYG_FS0595	3-Jul-23	3-Jul-25	12
Rayong Lab	Dissolved Oxygen	Chamber (Cold Room)	RYG_EN0184	25-Jan-23	25-Jul-24	12
Water Lab	Chloroform	Gas Chromatography (MSD)	BKK_EN0059	13-Dec-23	13-Jun-25	18
Water Lab	Bromoform	Gas Chromatography (MSD)	BKK_EN0059	13-Dec-23	13-Jun-25	18
Water Lab	Dibromochloromethane	Gas Chromatography (MSD)	BKK_EN0059	13-Dec-23	13-Jun-25	18
Water Lab	Total Trihalomethanes	Gas Chromatography (MSD)	BKK_EN0059	13-Dec-23	13-Jun-25	18
Water Lab	Bromodichloromethane	Gas Chromatography (MSD)	BKK_EN0059	13-Dec-23	13-Jun-25	18

Lot No. 2425435-1

ANALYZER CALIBRATION DATA

Client : Global Power Synergy PCL. Location : HRSGs 1
Date : 27 Mar 24 Test Operator : Sathaporn T.

O_2 ANALYZER
Model : TELEDYNE API 200EH Serial No. : 735
Span (%) : 25

	Cylinder Value (%)	Initial Analyzers Calibration Response (%)	Final Analyzers Calibration Response (%)	Difference (Percent of Span)
Zero Gas	0.00	0.01	0.01	0.00
Low-Level Gas	8.04	8.06	8.07	0.04
Span Gas	16.00	16.01	16.01	0.00

NO_x ANALYZER
Model : TELEDYNE API 200EH Serial No. : 735
Span (ppm) : 100

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	0.01	0.01	0.00
Low-Level Gas	54.98	54.94	54.94	0.00
Span Gas	82.51	82.50	82.48	0.02

SO2 ANALYZER
Model : TELEDYNE API 100EH Serial No. : 410
Span (ppm) : 100

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	0.01	0.01	0.00
Low-Level Gas	55.55	55.54	55.53	0.01
Span Gas	79.76	79.75	79.75	0.00

Calibrated by

Sathaporn.T

(Mr.Sathaporn Thakaew)

Environmental Field Scientist (3)

Lot No. 2425435-1

SYSTEM CALIBRATION BIAS AND DRIFT DATA

Client : Global Power Synergy PCL. Location : HRSGs 1
Date : 27 Mar 24 Test Operator : Sathaporn T.

O_2 ANALYZER
Cylinder Conc. (%) : 16.00 Span (%) : 25

	O_2 Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	0.01	0.02	0.04	0.02	0.04	0.00
Upscale Gas	16.01	16.02	0.04	16.02	0.04	0.00

NO_x ANALYZER
Cylinder Conc. (ppm) : 82.51 Span (ppm) : 100

	NO_x Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	0.01	0.02	0.01	0.02	0.01	0.00
Upscale Gas	82.50	82.45	0.05	82.45	0.05	0.00

SO_2 ANALYZER
Cylinder Conc. (ppm) : 79.76 Span (ppm) : 100

	SO_2 Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	0.01	0.01	0.00	0.01	0.00	0.00
Upscale Gas	79.75	79.72	0.03	79.71	0.04	0.01

CO2 ANALYZER
Cylinder Conc. (%) : 15.02 Span (%) : 25

	CO2 Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	0.01	0.03	0.05	0.03	0.05	0.00
Upscale Gas	15.01	14.98	0.12	14.98	0.12	0.00

Calibrated by

Sathaporn.T

(Mr.Sathaporn Thakaew)

Environmental Field Scientist (3)

EMISSION TEST RESULT

Client : Global Power Synergy PCL.
Date : 27 Mar 24
Start Time : 14:35
SO_2 Analyzer Model : TELEDYNE API 100EH
NO_x/O_2 Analyzer Model : TELEDYNE API 200EH
CO/CO_2 Analyzer Model : -

Run # : 1
Location : HRSGs 1
Test Operator : Sathaporn T.
Finish Time : 14:55
Serial No. : 410
Serial No. : 735
Serial No. : -

Time (min)	O_2 (%)	CO_2 (%)	NOx (ppm)	SO_2 (ppm)	CO (ppm)	Remark
14:35	13.63	4.37	11.65	0.06	-	
14:36	13.62	4.36	11.27	0.08	-	
14:37	13.63	4.34	13.96	0.08	-	
14:38	13.61	4.38	13.69	0.04	-	
14:39	13.62	4.38	13.53	0.10	-	
14:40	13.62	4.33	13.53	0.08	-	
14:41	13.62	4.37	13.47	0.08	-	
14:42	13.62	4.37	13.35	0.09	-	
14:43	13.61	4.37	13.24	0.06	-	
14:44	13.61	4.36	13.13	0.11	-	
14:45	13.61	4.34	13.09	0.07	-	
14:46	13.61	4.39	13.05	0.12	-	
14:47	13.61	4.39	13.99	0.10	-	
14:48	13.62	4.39	13.94	0.11	-	
14:49	13.62	4.38	13.94	0.10	-	
14:50	13.62	4.36	13.94	0.09	-	
14:51	13.62	4.38	13.99	0.12	-	
14:52	13.61	4.40	13.01	0.10	-	
14:53	13.60	4.35	13.09	0.09	-	
14:54	13.62	4.36	13.09	0.11	-	
14:55	13.62	4.33	13.02	0.09	-	
Average	**13.62**	**4.37**	**13.33**	**0.09**	-	

Sathaporn.T

(Mr.Sathaporn Thakaew)

Environmental Field Scientist (3)

EMISSION TEST RESULT

Client	Global Power Synergy PCL	Run #	2
Date	27 Mar 24	Location	HRSGs 1
Start Time	14:56	Test Operator	Sathaporn T.
SO_2 Analyzer Model	TELEDYNE API 100EH	Finish Time	15:16
NO_x/O_2 Analyzer Model	TELEDYNE API 200EH	Serial No.	410
CO/CO_2 Analyzer Model	-	Serial No.	735
		Serial No.	-

Time (min)	O_2 (%)	CO_2 (%)	NOx (ppm)	SO_2 (ppm)	CO (ppm)	Remark
14:56	13.61	4.36	9.95	0.10	-	
14:57	13.61	4.36	9.94	0.09	-	
14:58	13.60	4.40	9.89	0.11	-	
14:59	13.63	4.35	9.84	0.09	-	
15:00	13.61	4.35	9.79	0.03	-	
15:01	13.62	4.38	9.77	0.07	-	
15:02	13.61	4.38	9.75	0.08	-	
15:03	13.61	4.34	9.74	0.08	-	
15:04	13.61	4.38	9.80	0.08	-	
15:05	13.62	4.35	9.83	0.08	-	
15:06	13.63	4.38	9.78	0.08	-	
15:07	13.62	4.32	9.73	0.07	-	
15:08	13.63	4.39	9.70	0.06	-	
15:09	13.63	4.29	9.68	0.07	-	
15:10	13.62	4.37	9.69	0.08	-	
15:11	13.62	4.41	9.69	0.03	-	
15:12	13.61	4.36	9.79	0.00	-	
15:13	13.61	4.37	9.69	0.04	-	
15:14	13.62	4.36	9.65	0.07	-	
15:15	13.61	4.33	9.66	0.06	-	
15:16	13.60	4.37	9.72	0.05	-	
Average	13.62	4.36	9.78	0.07	-	

Sathaporn.T

(Mr.Sathaporn Thakaew)

Environmental Field Scientist (3)

EMISSION TEST RESULT

Client	Global Power Synergy PCL	Run #	3
Date	27 Mar 24	Location	HRSGs 1
Start Time	15:17	Test Operator	Sathaporn T.
SO_2 Analyzer Model	TELEDYNE API 100EH	Finish Time	15:37
NO_x/O_2 Analyzer Model	TELEDYNE API 200EH	Serial No.	410
CO/CO_2 Analyzer Model	-	Serial No.	735
		Serial No.	-

Time (min)	O_2 (%)	CO_2 (%)	NOx (ppm)	SO_2 (ppm)	CO (ppm)	Remark
15:17	13.60	4.34	9.73	0.03	-	
15:18	13.62	4.35	9.67	0.04	-	
15:19	13.63	4.32	9.66	0.04	-	
15:20	13.62	4.38	9.69	0.07	-	
15:21	13.62	4.38	9.73	0.07	-	
15:22	13.62	4.33	9.71	0.00	-	
15:23	13.60	4.38	9.72	0.08	-	
15:24	13.62	4.37	9.74	0.10	-	
15:25	13.62	4.36	9.72	0.09	-	
15:26	13.61	4.34	9.77	0.07	-	
15:27	13.63	4.34	9.82	0.07	-	
15:28	13.62	4.36	9.84	0.10	-	
15:29	13.61	4.34	9.85	0.09	-	
15:30	13.62	4.35	9.83	0.11	-	
15:31	13.61	4.39	9.82	0.08	-	
15:32	13.62	4.35	9.78	0.07	-	
15:33	13.62	4.30	9.85	0.07	-	
15:34	13.63	4.39	9.90	0.06	-	
15:35	13.62	4.38	9.88	0.10	-	
15:36	13.62	4.33	9.84	0.07	-	
15:37	13.62	4.33	9.87	0.05	-	
Average	13.62	4.35	9.78	0.07	-	

Sathaporn.T

(Mr.Sathaporn Thakaew)

Environmental Field Scientist (3)

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
6141 Easton Road
Bldg 2
Plumsteadville, PA 18949
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E04NI99E15A021C	Reference Number:	160-402020199-1
Cylinder Number:	CC709609	Cylinder Volume:	144.4 CF
Laboratory:	124 - Plumsteadville - PA	Cylinder Pressure:	2015 PSIG
PGVP Number:	A12021	Valve Outlet:	660
Gas Code:	CO,NO,NOX,SO2,BALN	Certification Date:	Feb 22, 2021

Expiration Date: Feb 22, 2029

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted.
Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
NOX	55.00 PPM	54.96 PPM	G1	+/- 1.4% NIST Traceable	02/15/2021, 02/22/2021
CARBON MONOXIDE	55.00 PPM	54.84 PPM	G1	+/- 0.7% NIST Traceable	02/15/2021
NITRIC OXIDE	55.00 PPM	54.69 PPM	G1	+/- 1.1% NIST Traceable	02/15/2021, 02/22/2021
SULFUR DIOXIDE	55.00 PPM	55.55 PPM	G1	+/- 1.0% NIST Traceable	02/15/2021, 02/22/2021
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	14060793	CC434455	49.88 PPM CARBON MONOXIDE/NITROGEN	+/- 0.6%	Feb 13, 2026
PRM	12386	D685025	9.91 PPM AIR/NITROGEN DIOXIDE	2.0%	Feb 20, 2020
NTRM	200611-04	CC707966	49.82 PPM NITRIC OXIDE/NITROGEN	+/-1.0%	Feb 02, 2025
GMIS	124206889	CC323707	4.028 PPM NITROGEN DIOXIDE/NITROGEN	2.1%	Aug 15, 2021
NTRM	0141709	KAL003190	49.67 PPM SULFUR DIOXIDE/NITROGEN	+/- 1.0%	Jun 20, 2022

The SRM, PRM or RGM noted above is only in reference to the GMIS used in the assay and not part of the analysis.

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet IS50 FTIR AUP2010245 CO	FTIR	Feb 04, 2021
Nicolet IS50 FTIR AUP2010245 NO	FTIR	Feb 11, 2021
Nicolet IS50 FTIR AUP2010245 NO2	FTIR	Feb 22, 2021
Nicolet IS50 FTIR AUP2010245 SO2	FTIR	Feb 18, 2021

Triad Data Available Upon Request

NOTES:
Gross Weight: 28.8 Kg
Net Weight: 4.8 Kg

Approved for Release

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
6141 Easton Road
Bldg 2
Plumsteadville, PA 18949
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E04NI99E3HA0002	Reference Number:	160-402138465-1
Cylinder Number:	ND11222	Cylinder Volume:	247.2 Cubic Feet
Laboratory:	124 - Plumsteadville - PA	Cylinder Pressure:	2215 PSIG
PGVP Number:	A12021	Valve Outlet:	660
Gas Code:	CO,NO,NOX,SO2,BALN	Certification Date:	Jul 15, 2021

Expiration Date: Jul 15, 2029

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted.
Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
NOX	80.00 PPM	82.51 PPM	G1	+/- 1.4% NIST Traceable	07/08/2021, 07/15/2021
CARBON MONOXIDE	80.00 PPM	79.74 PPM	G1	+/- 0.5% NIST Traceable	07/08/2021
NITRIC OXIDE	80.00 PPM	82.51 PPM	G1	+/- 1.4% NIST Traceable	07/08/2021, 07/15/2021
SULFUR DIOXIDE	80.00 PPM	79.76 PPM	G1	+/- 1.0% NIST Traceable	07/08/2021, 07/15/2021
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	11010130	KAL004536	97.31 PPM CARBON MONOXIDE/NITROGEN	+/- 0.4%	Oct 04, 2022
PRM	12386	D685025	9.91 PPM AIR/NITROGEN DIOXIDE	2.0%	Feb 20, 2020
NTRM	200610-50	CC733426	98.61 PPM NITRIC OXIDE/NITROGEN	+/- 0.9%	Oct 06, 2026
GMIS	124206889	CC323707	4.028 PPM NITROGEN DIOXIDE/NITROGEN	2.1%	Aug 15, 2021
NTRM	16010224	KAL003838	97.69 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.8%	Dec 23, 2021

The SRM, PRM or RGM noted above is only in reference to the GMIS used in the assay and not part of the analysis.

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet IS50 FTIR AUP2010245 CO	FTIR	Jun 24, 2021
Nicolet IS50 FTIR AUP2010245 NO	FTIR	Jul 01, 2021
Nicolet IS50 FTIR AUP2010245 NO2	FTIR	Jun 30, 2021
Nicolet IS50 FTIR AUP2010245 SO2	FTIR	Jul 09, 2021

Triad Data Available Upon Request

NOTES:
Gross Weight: 48.0 Kg
Net Weight: 7.8 Kg

Approved for Release

THE LINDE GROUP

Linde

CERTIFICATE OF ANALYSIS

Customer Detail:
ALS Laboratory Group (Thailand)

Cylinder Description:
STEEL 47 L

Production Order Number: **90145553**
Material Number: **478100-J-44**
Certification Date: **07-Dec-2017**
Expiry Date: **07-Dec-2025**

The measurement of this reference material is traceable to SI through the reference standard which is traceable to Swiss National Standard of Mass. The Assay of this Standard has been performed in accordance with the EPA Traceability Protocol EPA-600/R-12/531 for the Assay and Certification of Gaseous Calibration Standards using procedure G1. The results are expressed on a mole/mole basis, unless otherwise specified. The reported uncertainty is based on a standard uncertainty multiplied by coverage factor k=2, providing a level of confidence of approximately 95%.

Certificate Number: **3982/17**

Analyst: ARISSARA THONGNURL

Cylinder Number: **14465**

Nominal Cylinder Content: **6.520 M³**

Approve: SUKANYA KAMUTHARAT

Nominal Pressure: **145.0 Bar**

Valve Outlet: **CGA 590 BRASS**

To Re-Order Please Quote: **478100-J-44**

Comment:
- It is recommended that this product be not used below 5% of actual contents or should not be used when its gas pressure is below 150psig.
- Other impurities that detect by analytical condition of this mixture shall be report if it is more than 10% of minimum minor component.
- Keep and use in well-ventilated and secure area.

บริษัท ลินเด (ประเทศไทย) จำกัด (มหาชน)
อาคารเอ ชั้นที่ 15 เลขที่ 2/3 หมู่ 14 ถนนบางนา-ตราด กม. 6.5 ตำบลบางแก้ว
อำเภอบางพลี จังหวัดสมุทรปราการ 10540 โทรศัพท์ (66) 2338-6100 โทรสาร (66) 2338-6333
โรงงานเวลโกรว: 105 หมู่ 5 ตำบลบึงคำพร้อย อำเภอลำลูกกา 12150
โทรศัพท์ (66) 38 570-479-93 โทรสาร (66) 38 570-323

Linde (Thailand) Public Company Limited
15th Floor, Bangna Tower A, 2/3 Moo 14, Bangna Trad Rd. 6.5 Road, Bangkaew
Bangplee, Samutprakarn 10540, Tel (66) 2338-6100 Fax (66) 2338-6333
Wellgrow Plant: 105 Moo 5, T.Bungsamak, A.Bungpakong, Chachoengsao 24180
Thailand, Tel (66) 38.570-479-93 Fax (66) 38.570-323

THE LINDE GROUP

Linde

CERTIFICATE OF ANALYSIS

Analytical Result

Component	Request Concentration	Certified Concentration	Certified Uncertainty	Method	Assay Date
Oxygen In Nitrogen	8.00 %	8.04 %	± 1% rdative	(2) I-PB-354	04-Dec-2017

Reference Standard used in Assay

Reference Standard	Cylinder No.	Concentration	Expired Date
Oxygen In Nitrogen	113553SG	9.976± 0.02 %	26-Mar-2018

Analytical Instruments used in Assay

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Servomex 4100 O2 Analyzer	Paramagnetic	04-Dec-2017

Method of Analysis
1. Gas Chromatograph
2. Paramagnetic Oxygen Analyser
3. Electrochemical Oxygen Analyser
4. Electrochemical Moisture Analyser
5. Total Hydrocarbon Analyser
6. Other specified

Cylinder Number **14465**
Production Order Number **90145553**

Certifcation Date: **07-Dec-2017**
Expiration Date: **07-Dec-2025**

บริษัท ลินเด (ประเทศไทย) จำกัด (มหาชน)
อาคารเอ ชั้นที่ 15 เลขที่ 2/3 หมู่ 14 ถนนบางนา-ตราด กม. 6.5 ตำบลบางแก้ว
อำเภอบางพลี จังหวัดสมุทรปราการ 10540 โทรศัพท์ (66) 2338-6100 โทรสาร (66) 2338-6333
โรงงานเวลโกรว: 105 หมู่ 5 ตำบลบึงคำพร้อย อำเภอลำลูกกา 12150
โทรศัพท์ (66) 38.570-479-93 โทรสาร (66) 38.570-323

Linde (Thailand) Public Company Limited
15th Floor, Bangna Tower A, 2/3 Moo 14, Bangna Trad Rd. 6.5 Road, Bangkaew
Bangplee, Samutprakarn 10540, Tel (66) 2338-6100 Fax (66) 2338-6333
Wellgrow Plant: 105 Moo 5, T.Bungsamak, A.Bungpakong, Chachoengsao 24180
Thailand, Tel (66) 38.570-479-93 Fax (66) 38.570-323

THE LINDE GROUP

Linde

CERTIFICATE OF ANALYSIS

Customer Detail:
ALS Laboratory Group (Thailand)

Cylinder Description:
STEEL 47 L

Production Order Number: **90145554**
Material Number: **557200-J-44**
Certification Date: **07-Dec-2017**
Expiry Date: **07-Dec-2025**

The measurement of this reference material is traceable to SI through the reference standard which is traceable to Swiss National Standard of Mass. The Assay of this Standard has been performed in accordance with the EPA Traceability Protocol EPA-600/R-12/531 for the Assay and Certification of Gaseous Calibration Standards using procedure G1. The results are expressed on a mole/mole basis, unless otherwise specified. The reported uncertainty is based on a standard uncertainty multiplied by coverage factor k=2, providing a level of confidence of approximately 95%.

Certificate Number: **3977/17**

Analyst: ARISSARA THONGNURL

Cylinder Number: **94892**

Nominal Cylinder Content: **6.560 M³**

Approve: SUKANYA KAMUTHARAT

Nominal Pressure: **145.0 Bar**

Valve Outlet: **CGA 590 BRASS**

To Re-Order Please Quote: **557200-J-44**

Comment:
- It is recommended that this product be not used below 5% of actual contents or should not be used when its gas pressure is below 150psig.
- Other impurities that detect by analytical condition of this mixture shall be report if it is more than 10% of minimum minor component.
- Keep and use in well-ventilated and secure area.

บริษัท ลินเด (ประเทศไทย) จำกัด (มหาชน)
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THE LINDE GROUP

Linde

CERTIFICATE OF ANALYSIS

Analytical Result

Component	Request Concentration	Certified Concentration	Certified Uncertainty	Method	Assay Date
Oxygen In Nitrogen	16.0 %	16.0 %	± 1% relative	(2) I-PB-354	04-Dec-2017

Reference Standard used in Assay

Reference Standard	Cylinder No.	Concentration	Expired Date
Oxygen In Nitrogen	113553SG	9.976± 0.02 %	26-Mar-2018

Analytical Instruments used in Assay

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Servomex 4100 O2 Analyzer	Paramagnetic	04-Dec-2017

Method of Analysis
1. Gas Chromatograph
2. Paramagnetic Oxygen Analyser
3. Electrochemical Oxygen Analyser
4. Electrochemical Moisture Analyser
5. Total Hydrocarbon Analyser
6. Other specified

Cylinder Number **94892**
Production Order Number **90145554**

Certifcation Date: **07-Dec-2017**
Expiration Date: **07-Dec-2025**

บริษัท ลินเด (ประเทศไทย) จำกัด (มหาชน)
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Thailand, Tel (66) 38.570-479-93 Fax (66) 38.570-323

CONSOLE CONTROL UNIT CALIBRATION TEST REPORT

Barometric Pressure (mmHg) : 754.7
Relative Humidity (%) : 55.0
Temperature (°C) : 27.2

Calibration of Date : 9-Jan-24
Next Cal. Date : 9-Jul-24

Console Control Meter Data
Calibration No. : C-090124-RYG_FS0315
Dry Gas Meter ID : RYG_FS0315
Serial No. : 1706091
Model No. : XC-572-V

Reference Dry Gas Meter Data
Reference Dry Gas Meter ID : BKK_FS1122
Serial No. : A2003240
Correction Factor (Y) : 0.9824
Next Calibration Date : 7-Nov-24

ΔH (mm H2O)	Θ Minutes	Reference Dry Gas Meter Calibration: Vr (Liters) Final	Vr (Liters) Initial	Vr (Liters) Total	Tr (°C)	Console Control : Dygas Meter: Vm (Liters) Final	Vm (Liters) Initial	Vm (Liters) Total	Ti (°C)	To (°C)	Avg Tm (°C)	Dry Gas Meter Correction Factor (Y)	Orifice Calibration Factor ΔH@
15	12.60	150.00	0.00	150.00	26.0	1906727.4	1906577.0	150.40	26.0	26.0	26.0	0.9784	48.8062
25	9.78	150.00	0.00	150.00	26.0	1906896.2	1906746.0	150.20	26.0	26.0	26.0	0.9787	48.4627
50	6.88	150.00	0.00	150.00	26.0	1907057.8	1906908.0	149.80	27.0	27.0	27.0	0.9822	47.8004
80	5.38	150.00	0.00	150.00	26.0	1907222.8	1907073.0	149.80	27.0	27.0	27.0	0.9794	46.7729
120	4.40	150.00	0.00	150.00	26.0	1907386.8	1907237.0	149.80	28.0	28.0	28.0	0.9854	46.7715
											Avg	0.9808	47.8243

Y = Ratio of reading of reference to dry gas meter : tolerance for individual values ± 0.02 from average
ΔH@ = Orifice pressure differential that equates to 21.24 m of air @ 25 C and 760 mm of mercury , mmH2O : tolerance for individual values ± 5.08 from average

Procedure: 40 CFR 60, APP A, METH -5EC 5.3 & 7

Calibrated by: Saksit Phaisanphisut
(Mr. Saksit Phaisanphisut)
RYG Field Service Scientist(4)

Approved by: Natthapol Jiengwareewong
(Mr.Natthapol Jiengwareewong)
RYG Field Service Specialist(1)

Stopwatch Calibration Test Report

Calibration Date : 9 Jan 24
Next Cal. Date : 9 Jul 24
Barometric Pressure (mmHg) : 754.7
Temperature (°C) : 27.2
Relative Humidity (%) : 55.0

Reference Stopwatch Data
Stopwatch ID No. : E18061
Model : F808
Serial No. : -
Calibration Date : 8 Sep 20
Certificate No. : E-2009018

Console Control Meter Data
Dry Gas Meter No. : RYG_FS0315
Model : XC-572-V
Serial No. : 1706091

Run No.	Time Actual (m:ss:ms)	Time Reading (m:ss)	Diff. (ms)	Diff. (min)
1	5:00:03	5:00	3	0.00005
2	5:00:09	5:00	8	0.00013
3	5:00:09	5:00	9	0.00015
4	5:00:11	5:00	11	0.00018
5	5:00:05	5:00	5	0.00008
6	5:00:06	5:00	6	0.00010
7	5:00:06	5:00	6	0.00010
8	5:00:08	5:00	8	0.00013
9	5:00:09	5:00	9	0.00015
10	5:00:07	5:00	7	0.00012
		Average		0.00012
		SD		0.00004

Calibrate by : Saksit Phaisanphisut
Mr. Saksit Phaisanphisut
RYG Field Service Scientist (4)

Approved by : Natthapol Jiengwareewong
Mr.Natthapol Jiengwareewong
RYG Field Service Specialist (1)

DIGITAL TEMPERATURE CALIBRATION DATA SHEET

Calibration Date : 9 Jan 24
Ambient Temperature (°C) : 27.2
Calibration sheet No. : C-090124-RYG_FS0315
Relative Humidity (%) : 55

Digital Temperature ID : RYG_FS0315
Serial No. : 1706091
Model : XC-572-V

Reference Temperature ID : RYG_FS0681
Serial No. : 201090014918
Model : Digicon-CC-VT-MS
Next Calibrate : 13 Nov 24

Location	Reference Temperature °C	Digital Temperature °C	Error °C	MPE	Pass / Fail
Stack	0	-1	-1	±3	Pass
	25	25	0	±3	Pass
	50	50	0	±3	Pass
	100	101	1	±3	Pass
	150	151	1	±3	Pass
	200	200	0	±3	Pass
	250	250	0	±3	Pass
	300	301	1	±3	Pass
	500	502	2	±3	Pass
Probe	100	102	2	±3	Pass
	120	121	1	±3	Pass
	140	141	1	±3	Pass
Oven	100	101	1	±3	Pass
	120	121	1	±3	Pass
	140	141	1	±3	Pass
Filter	100	101	1	±3	Pass
	120	121	1	±3	Pass
	140	141	1	±3	Pass
Exit	0	0	0	±3	Pass
	10	10	0	±3	Pass
	20	20	0	±3	Pass
Meter	0	-1	-1	±3	Pass
	25	24	-1	±3	Pass
	50	48	-2	±3	Pass
AUX	0	0	0	±3	Pass
	25	25	0	±3	Pass
	50	50	0	±3	Pass

MPE : (Maximum permissible error of measurement) ค่าความผิดพลาดสูงสุดของการวัดที่ยอมได้

Calibrated by : Saksit Phaisanphisut
(Mr. Saksit Phaisanphisut)
RYG Field Service Scientist (4)

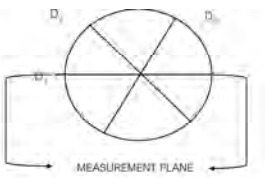
Approved by : Natthapol Jiengwareewong
(Mr.Natthapol Jiengwareewong)
RYG Field Service Specialist (1)

PROBE NOZZLE DIAMETER CALIBRATION DATA SHEET

Calibration Date : 9 Jan 24
Nozzle Set ID. : RYG_FS0319
Calibration Sheet No. : C-090124-RYG_FS0319
Vernier Caliper ID. : BKK_FS1123

Nozzle ID #	Nozzle Diameter (cm.) D_1	D_2	D_3	Hi - Lo ΔD	$(D_1 + D_2 + D_3) / 3$ D_{avg}
1	0.298	0.300	0.305	0.007	0.301
2	0.465	0.475	0.465	0.010	0.468
3	0.605	0.605	0.605	0.000	0.605
4	0.770	0.760	0.765	0.010	0.765
5	0.930	0.928	0.930	0.002	0.929
6	1.082	1.080	1.085	0.005	1.082
7	1.240	1.230	1.235	0.010	1.235
8	1.594	1.558	1.551	0.043	1.568

Where :
D_1, D_2, D_3 = There different nozzle diameters at 60 degrees to each other, each measured the nearest 0.025 mm.
ΔD = Maximum distance between any two diameters must be ≤ 0.100 mm.
D_{avg} = $(D_1 + D_2 + D_3) / 3$

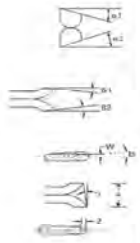


Calibrated by : Saksit Phaisanphisut
(Mr. Saksit Phaisanphisut)
RYG Field Service Scientist (4)

Approved by : Natthapol Jiengwareewong
(Mr.Natthapol Jiengwareewong)
RYG Field Service Specialist (1)

Type S Pitot Tube Calibration

Date Calibration	9-Jan-24	**Due Date**	9-Jul-24
Pitot ID	RYG_FS0321	**Inclinometer ID**	BKK_FS1131
Pitot SN	-	**Vernier ID**	RYG_FS0539



Parameter	Value	Allowable Range	Check
α1	-1.4	-10° < α1 < +10°	OK
α2	-0.2	-10° < α2 < +10°	OK
β1	0.3	-5° < β1 < +5°	OK
β2	-0.4	-5° < β2 < +5°	OK
γ	0.3	-	-
θ	0.5	-	-
Z = A tan γ	0.013	Z ≤ 0.125"	OK
W = A tan θ	0.008	W ≤ 0.031"	OK
Dt	0.310	0.188" to 0.375"	OK
A/2Dt	1.434	1.05 ≤ PA/Dt ≤ 1.5	OK
A	0.52	2.1Dt ≤ A ≤ 3Dt	OK

Certify that pitot tube/porbe meets or exceeds all specifications, crieria and/or applicable design features and is hereby assigned a pitot tube certification fact of 0.84 . See 40 CFR Pt. 60, App. A,EPA Method 2.

Calibrated by : Saksit Phaisanphisut
(Mr. Saksit Phaisanphisut)
RYG Field Services Scientist (4)

Approved By : Natthapon Jiengwareewong
(Mr.Samart Roo-ngan)
RYG Field Services Specialist (1)

Sartorius (Thailand) Co., Ltd.
129 Rama 9 Road, Huaykwang, Huaykwang, Bangkok 10310
Tel: +66 2643 8361-6 , e-mail: service.thailand@sartorius.com

NSC-TISI-TIS 17025
CALIBRATION 0426

SARTORIUS

REVIEW BY Thanitale
APPROVED BY D.
NEXT CAL. DATE 22/02/2025

Certificate of Calibration

Model Number : MSU224S-100-DU
Description : Analytical Balance
Serial Number : 0031709552
ID No. : RYG_EN0003
Manufacturer : Sartorius

Certificate No. : 24BCI0073
Issued Date : Friday, February 23, 2024
Reference No. : 229196
Page No. : 1 of 2

Customer Name : ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
616/10 Moo 5 T.Maenam Khu, A.Pluak Daeng, Rayong 21140, Thailand.

Calibrated Place : ALS Laboratory Group (Thailand) Co., Ltd.(Ealance Room)
616/10 Moo 5 T.Maenam Khu, A.Pluak Daeng, Rayong 21140, Thailand.

Calibrated By : Mr.Chonchai Inthana
Calibration Date : Thursday, February 22, 2024

Calibration Procedure No. : This calibration was conducted by Using in-house calibration procedure number (WI-003) Based on UKAS LAB 14 : 2019

Metrological data :
Capacity : 220 g Readability : 0.0001 g

Ambients Conditions:
Temperature : 23.7 °C ± 5.0 °C
Humidity : 62.0 % RH ± 10.0 % RH
Pressure ± -

Reasons for calibration
☐ New Installation ☐ Service / Repaired ☑ Re-calibration/ Maintenance

Equipment Condition: ☑ Good Operate ☐ Fair

Measurement Method UKAS Publication Ref :Lab 14

The measurement uncertainty stated is the expended uncertainty which is obtained from the standard uncertainty multiplied by the coverage factor (k=2) to provide a level of confidence of approximately 95%. It is determined in accordance with the Guide to Expression of Uncertainty in Measurement (GUM). The calibration certificate documents the traceability to National Standards, which realise the unit of measurement according to the International Standard System of Units (SI). Report of Tolerance came form list of Sartorius Metrological Specifications.

Traceability:

Model Number	Description	Traceability	Cetificate No.	Due Date
YCS011-522-00	Sartorius weight set 1mg - 5000g E2,YCS011-522-00	TCS	M2308197S	23-Aug-2025
MHB-382SD	Humidity/Barometer/Temp Lutron MHB-382SD	DKSH	C19231845	23-Aug-2024

This certificate relate and apply this equipment only.
This certificate may not be reproduced other than in full except with the prior written approval of the Verification Operation Division Sartorius (Thailand) Co., Ltd.

Mr.chonchai Inthana(Technical Manager)

STAMP

Sartorius (Thailand) Co., Ltd.
129 Rama 9 Road, Huaykwang, Huaykwang, Bangkok 10310
Tel: +66 2643 8361-6 Fax: +66 2643-8367, e-mail: service.thailand@sartorius.com

SARTORIUS

Certificate of Calibration

Model Number : MSU224S-100-DU
Description : Analytical Balance
Serial Number : 0031709552
ID No. : RYG_EN0003
Manufacturer : Sartorius

Certificate No. : 24BCI0073
Issued Date : Friday, February 23, 2024
Reference No. : 229196
Page No. : 2 of 2

Calibration Results : Without Adjustment

Repeatability

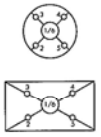
The reproducibility is the ability of a weighing instrument to display nearly identical readouts under constant test conditions when the same load within a measurement series is placed repeatedly on the weighing pan in the same manner. The standard deviation is used to express reproducibility quantitatively.

Nominal Value : (Low Load) 20 g	20.0000	200.0001
	20.0000	200.0000
Tolerance 0.0001 g	20.0001	200.0001
	20.0000	200.0001
	20.0000	200.0001
Nominal Value : (High Load) 200 g	20.0000	200.0001
	19.9999	200.0001
Tolerance 0.0001 g	20.0000	200.0000
	20.0000	200.0000
	20.0000	200.0001
Standard Deviation	0.00005	0.00005

Eccentricity (Off-center loading error)

The off-center loading error is yielded by the difference between the readout of the load, i.e. 1/3 or 1/4 of maximim capacity, placed in the middle of the weighing pan and between each of four additional measurement points (positions defined according to OIML R76).

Nominal value : 100 g
Tolerance 0.0004 g



	Difference
1	-
2	0.0000
3	-0.0001
4	0.0000
5	0.0001
6	-

Linearity

The linearity, also called linearity error. Describes the deviation of the characteristic curve of a weighing instrument from the linear slope.

Tolerance 0.0002 g

Nominal Value (g)	Conventional Mass Value (g)	Displayed Value (g)	Deviation (g)	Uncertainty (g)
0.01	0.0100	0.0100	0.0000	0.00013
0.1	0.1000	0.1000	0.0000	0.00013
0.5	0.5000	0.5000	0.0000	0.00013
1	1.0000	1.0000	0.0000	0.00013
5	5.0000	5.0000	0.0000	0.00013
10	10.0000	10.0000	0.0000	0.00013
20	20.0000	20.0000	0.0000	0.00013
50	50.0000	50.0000	0.0000	0.00024
100	100.0000	99.9999	-0.0001	0.00018
200	200.0000	199.9999	-0.0001	0.00029

Erd of Report.

DRY GAS METER CALIBRATION TEST REPORT

Calibration of Date 9-Jan-24
Next Calibration Date 9-Jul-24

Barometric Pressure (mm.Hg) : 754.7
Relative Humidity (%) : 55.0
Temperature (°C) : 27.2

Dry Gas Meter Data
Calibration sheet No. : C-090124-RYG_FS0317
Dry Gas Meter ID RYG_FS0317
Serial No. 1706003
Model No XC-62-CV

Reference Dry Gas Meter Data
Reference Dry Gas Meter ID : BKK_FS1122
Serial No. : A2003240
Correction Factor (Y) : 0.9824
Next Calibration Date : 7-Nov-24

Reference Dry Gas Meter Calibration				Dry Gas Meter						Dry Gas Meter Correction Factor
Vr (Liters)			Tr	Vm (Liters)			Ti	To	Avg. Tm	
Final	Initial	Total	(°C)	Final	Inital	Total	(°C)	(°C)	(°C)	(Y)
30.00	0.00	30.00	29.0	30.14	0.00	30.14	26.0	26.0	26.0	0.9682
30.00	0.00	30.00	29.0	30.14	0.00	30.14	26.0	26.0	26.0	0.9682
60.00	0.00	60.00	29.0	60.05	0.00	60.05	26.0	26.0	26.0	0.9718
60.00	0.00	60.00	29.0	60.05	0.00	60.05	26.0	26.0	26.0	0.9718
90.00	0.00	90.00	28.0	90.77	0.00	90.77	26.0	26.0	26.0	0.9676
90.00	0.00	90.00	28.0	90.77	0.00	90.77	26.0	26.0	26.0	0.9676
									Avg.	0.9692

Y = Ratio of reading of reference dry gas meter to dry gas meter : tolerance for individual ± 0.005 from average.

Calibrate by : Jittakorn Sriwasa
Mr. (jittakorn sriwasa)
RYG Field ServiceScientist (2)

Approved By : Natthapon Jiengwareewong
Mr.Natthapol Jiengwareewong
RYG Field ServiceSpecialist (1)

Stopwatch Calibration Test Report

Calibration Date :	9 Jan 24	Next Cal. Date :	9 Jul 24
Barometric Pressure (mmHg) :	754.7	Temperature (°C) :	27.2
Relative Humidity (%) :	55.0		

Reference Stopwatch Data		Console Control Meter Data	
Stopwatch ID No. :	E1806	Dry Gas Meter No. :	RYG_FS0317
Model :	F808	Model :	XC-62-CV
Serial No. :	-	Serial No. :	1706003
Calibration Date :	8 Sep 20		
Certificate No. :	E-2008018		

Run No.	Time Actual (m:ss;ms)	Time Reading (m:ss)	Diff. (ms)	Diff. (min)
1	5:00.03	5:00	3	0.00005
2	5:00.09	5:00	8	0.00013
3	5:00.09	5:00	9	0.00015
4	5:00.11	5:00	11	0.00018
5	5:00.05	5:00	5	0.00008
6	5:00.06	5:00	6	0.00010
7	5:00.06	5:00	6	0.00010
8	5:00.08	5:00	8	0.00013
9	5:00.09	5:00	9	0.00015
10	5:00.07	5:00	7	0.00012
			Average	0.00012
			SD	0.00004

Calibrate by : Saksit Phaisanphisut — Mr. Saksit Phaisanphisut — Field Scientist (4)

Approved by : Natthapol Jiengwareewong — Mr.Natthapol Jiengwareewong — Specialist (1)

DIGITAL TEMPERATURE CALIBRATION DATA SHEET

Calibration Date :	9 Jan 24	Ambient Temperature (°C)	27.2
Calibration sheet No. :	C-090124-RYG_FS0317	Relative Humidity (%) :	55
Digital Temperature ID :	RYG_FS0317	Reference Temperature ID	RYG_FS0681
Serial No. :	1706003	Serial No. :	201090014918
Model :	XC-62-CV	Model :	Digicon-CC-VT-MS
		Next Calibrate :	13 Nov 24

Location	Reference Temperature °C	Digital Temperature °C	Error °C	MPE	Pass / Fail
Stack	0	0	0	±3	Pass
	25	25	0	±3	Pass
	50	50	0	±3	Pass
	100	100	0	±3	Pass
	150	150	0	±3	Pass
	200	200	0	±3	Pass
	250	251	1	±3	Pass
	300	301	1	±3	Pass
	500	501	1	±3	Pass
Probe	100	101	1	±3	Pass
	120	121	1	±3	Pass
	140	141	1	±3	Pass
Oven	100	101	1	±3	Pass
	120	120	0	±3	Pass
	140	140	0	±3	Pass
Filter	100	101	1	±3	Pass
	120	121	1	±3	Pass
	140	141	1	±3	Pass
Exit	0	0	0	±3	Pass
	10	10	0	±3	Pass
	20	20	0	±3	Pass
Meter	0	0	0	±3	Pass
	25	25	0	±3	Pass
	50	50	0	±3	Pass
AUX	0	1	1	±3	Pass
	25	26	1	±3	Pass
	50	51	1	±3	Pass

MPE : (Maximum permissible error of measurement) ค่าความผิดพลาดสูงสุดของการวัดเที่ยงยอมได้

Calibrated by : Jittakorn Sriwasa — (Mr.Jittakorn Sriwasa) — Enviro Field Service Scientist (2)

Approved by : Natthapol Jiengwareewong — Mr.Natthapol Jiengwareewong — Enviro Field Service Specialist (1)

FORM NO.: F 06-027 REVISION NO.: 2 ISSUE DATE: 16/2/23

DKSH

Certificate of Calibration

NSC-TSI-TS 17025 Calibration 0067

Equipment:	SPECTROPHOTOMETER	Certificate No.:	C06230441
Model:	DR6000	Issued Date:	19 September 2023
Serial No. (or ID.):	1627845 (RYG_EN0037)	Job No.:	WO-00005382
Manufacturer:	HACH	Page:	1 of 3
Condition:	In Condition		

Customer: ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
616/10 Moo 5 T.Maenam Khu,
A.Pluakdaeng, Rayong 21140, Thailand.

REVIEW BY N. Bamrat
APPROVED BY D.
NEXT CAL. DATE 18/3/25

Environment Condition: Temperature 23.9 °C ± 0.2 °C; Humidity 65.3 %RH ± 1.4 %RH

Calibration Place: ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch) (Wet Chemistry)
616/10 Moo 5 T.Maenam Khu,
A.Pluakdaeng, Rayong 21140, Thailand.

Calibration By: Mr.Nattapat Rungrueang
Calibration Date: 18 September 2023
The Method used: In house method, CAL-WI-24, base on ASTM E 275-08 and ASTM E 387-04
Traceability: This certificate is traceable to the CRM maintained by National Institute of Standards and Technology (NIST) through Starna Scientific Limited.

The standard for Wavelength Certificate No. 111583 and 111584
The standard for Photometric Certificate No. 9114984 and 111588
The standard for Stray light Certificate No. 111586 and 111585
The standard for Spectral resolution Certificate No. 111587

(Mr. Nattapat Rungrueang) Person in charge

(Mr. Nitinun Srihawan) Authorized signatory

This certificate is issued the units of measurement according to the International System of Units (SI). It provides traceability of measurement to international or national standard or other recognized national standard laboratories.
The measurement uncertainty stated is the expanded uncertainty which is obtained from the standard uncertainty multiplied by the coverage factor (k=2) to provide a level of confidence of approximately 95%. It is determined in accordance with the Guide to Expression of Uncertainty in Measurement (GUM).
These results may be affected by deviations from specified conditions. The results relate only to the items tested, calibrated or sampled. The report shall not be reproduced except in full without approval of DKSH Technology Limited.

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2833 Sukhumvit Road, Bangchak, Phrakhanong, Bangkok 10260
Phone: +66 2639 7000 Email: info.calibration@dksh.com Website: www.dksh.com/scientific-thailand

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Calibration Results:
Without Adjustment

Wavelength Accuracy (nm), The spectral bandwidth of Std at 2 nm and UUC at 2 nm

Standard Wavelength	Unit Under Calibration	Correction	Uncertainty
418.61	418.3	0.31	0.13
536.66	536.6	0.06	0.13
637.98	638.3	-0.32	0.13
748.48	748.7	-0.22	0.13
807.03	807.4	-0.37	0.13

Photometric Accuracy (Absorbance)

Wavelength	Standard absorbance	Unit Under Calibration	Correction	Uncertainty
420 nm	0.0000	0.000	0.0000	0.0045
	0.2930	0.289	0.0040	0.0045
	0.5168	0.519	-0.0022	0.0045
	1.0298	1.029	0.0008	0.0045
440 nm	0.0000	0.000	0.0000	0.0045
	0.2867	0.283	0.0037	0.0045
	0.5073	0.509	-0.0017	0.0045
	1.0083	1.007	0.0013	0.0045
465 nm	0.0000	0.000	0.0000	0.0045
	0.2516	0.250	0.0016	0.0045
	0.4595	0.462	-0.0025	0.0045
	0.9334	0.933	0.0004	0.0045
546.1 nm	0.0000	0.000	0.0000	0.0045
	0.2461	0.245	0.0011	0.0045
	0.4652	0.466	-0.0008	0.0045
	0.9468	0.946	0.0008	0.0045
590 nm	0.0000	0.000	0.0000	0.0045
	0.2594	0.259	0.0004	0.0045
	0.5040	0.505	-0.0010	0.0045
	1.0032	1.002	0.0012	0.0045
635 nm	0.0000	0.000	0.0000	0.0045
	0.2579	0.257	0.0009	0.0045
	0.4971	0.497	0.0001	0.0045
	0.9720	0.971	0.0010	0.0045

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CAL-FM-C06-15: 12 Sep 2022

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Calibration Results:

Without Adjustment

Photometric Accuracy (Absorbance)

Wavelength	Standard absorbance	Unit Under Calibration	Correction	Uncertainty
235 nm	0.0000	0.000	0.0000	0.0080
	0.7355	0.737	-0.0015	0.0080
257 nm	0.0000	0.000	0.0000	0.0080
	0.8574	0.857	0.0004	0.0080
313 nm	0.0000	0.000	0.0000	0.0080
	0.2864	0.290	-0.0036	0.0080
350 nm	0.0000	0.000	0.0000	0.0080
	0.6374	0.637	0.0004	0.0080

Stray light *

Standard: cut-off	UUC: Wavelength (nm)	UUC: Transmission (%T)	Absorbance (A)
260.62 +/- 0.11 nm	260.8	1.3	1.886
391.44 +/- 0.11 nm	391.4	1.3	1.886

Spectral Resolution *

Nominal Concentration 0.02 % v/v	Peak	Trough	Ratio	SBW
Standard Wavelength (nm)	268.66	268.89	1.38	2.00
UUC: Wavelength (nm)	268.2	266.1		
Std Absorbance (A)	0.4566	0.2780		
Absorbance (A)	0.413	0.300		

* Calibration Marked * Not TISI Accredited * in this Certificate have been included for completeness.

The End of Certificate

บริษัท ดีเคเอสเอช เทคโนโลยี จำกัด
DKSH Technology Limited
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Phone: +66 2639 7000 Email: info.calibration@dksh.com Website: www.dksh.com/scientific-thailand

DKSH

ใบตรวจสอบสภาพเครื่องวัดสิ่งแวดล้อม

เลขที่ใบงาน: WO-00005382

ชนิดเครื่องมือ: SPECTROPHOTOMETER รุ่น: DR6000 หมายเลขเครื่อง: 1627845

ตรวจสอบ (รับ) 18 Sep 2023 ปกติ	ตรวจสอบ (รับ) 18 Sep 2023 ไม่ปกติ	รายการตรวจเช็ค	ตรวจสอบ (ส่ง) 18 Sep 2023 ปกติ	ตรวจสอบ (ส่ง) 18 Sep 2023 ไม่ปกติ	หมายเหตุ
		General			
☑	☐	1. ความสมบูรณ์เครื่อง	☑	☐	
☑	☐	2. ความสะอาด (ช่องใส่ตัวอย่าง, ภายใน-นอกเครื่อง)	☑	☐	
☑	☐	3. สวิทช์ ปิด – เปิด เครื่อง (On-Off Swicth)	☑	☐	
☑	☐	4. ปุ่มกด (Keypad)	☑	☐	
☑	☐	5. หน้าจอ (Display, Screen Contrast)	☑	☐	
		Spectrophotometer			
☐	☐	6. แรงดันไฟฟ้า (Battery Backup) >= 2.5 VDC	☐	☐	
☐	☐	7. ตัวหมุนเลือกความยาวคลื่น (Wavelength Control)	☐	☐	
☑	☐	8. ความยาวคลื่น (Wavelength Check)	☑	☐	*
☑	☐	9. แหล่งกำเนิดแสง (UV < 3,000 hour)	☑	☐	9.2 Hours
☑	☐	10. แหล่งกำเนิดแสง (Visible < 5,000 hour)	☑	☐	741.5 Hours
☑	☐	11. ช่องวัดหลายตัวอย่าง (Carousel Module)	☑	☐	
		pH Meter and Conductivity Meter			
☐	☐	12. อิเล็คโทรด (Electrode and Connection Cable)	☐	☐	
☐	☐	13. ระดับสารละลายใน Electrode (Level KCl)	☐	☐	
☐	☐	14. ฝาปิดกันปลาย Electrode (Dust Protection Hood)	☐	☐	
☐	☐	15. ขาจับอิเล็คโทรด (Stand)	☐	☐	
		Turbidimeter			
☐	☐	16. ค่าความขุ่นที่ต่ำสุด (No Sample)	☐	☐	
☐	☐	17. ระดับการส่องสว่างของแสง (>= 2.5 ไม่เกิน 3.0)	☐	☐	
		Automatic titrator			
☐	☐	18. สภาพ Piston Burettes	☐	☐	
☐	☐	19. Function Rinsing and Dosing	☐	☐	
☐	☐	20. ระบบท่อสายยางและอุปกรณ์ประกอบ	☐	☐	

เพิ่มเติม/ข้อแนะนำ : *656.1nm=656.1nm

*486.0nm=485.5nm

Mr.Nattapat Rungrueang

Service Engineer

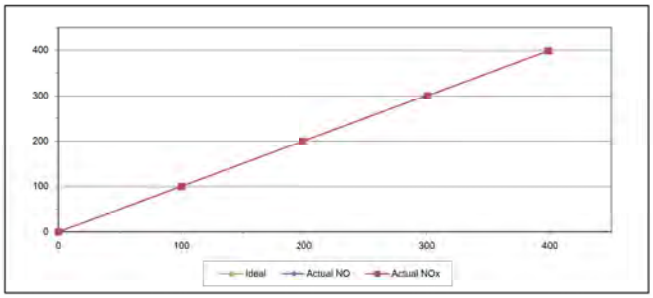
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ALS

MULTIPOINT CALIBRATION REPORT

Calibration Date	4-Jan-24	Equipment Name	NOx Analyzer
Manufacturer	HORIBA	Model	APNA-370
Serial No.	7AV89544	Equipment ID	RYG_FS0272
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	55.88	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS						
	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	Error NOx	%Error NOx
ZERO	0.00	0.05	0.05	0.05	0.10	0.10	0.10
1	100.00	99.10	-0.90	-0.90	100.10	0.10	0.10
2	200.00	198.50	-1.50	-0.75	199.20	-0.80	-0.40
3	300.00	298.70	-1.30	-0.43	300.50	0.50	0.17
4	400.00	398.10	-1.90	-0.47	398.70	-1.30	-0.33
AVERAGE (%)				-0.50			-0.07



Calibrated By

(Mr.Jirawut Sakarn)
Field Environmental Scientist (3)

Approved By

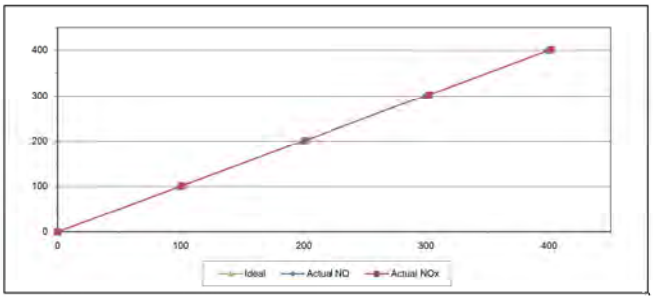
(Mr.Sarayuth Jittranont)
Assistant General Manager

ALS

MULTIPOINT CALIBRATION REPORT

Calibration Date	4-Jan-24	Equipment Name	NOx Analyzer
Manufacturer	HORIBA	Model	APNA-370
Serial No.	R06K0177	Equipment ID	RYG_FS0463
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	55.88	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS						
	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	Error NOx	%Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10	0.10
1	100.00	98.80	-1.20	-1.20	101.10	1.10	1.10
2	200.00	201.30	1.30	0.65	201.20	1.20	0.60
3	300.00	299.40	-0.60	-0.20	302.60	2.60	0.87
4	400.00	398.70	-1.30	-0.33	401.50	1.50	0.38
AVERAGE (%)				-0.20			0.61



Calibrated By

(Mr.Jirawut Sakarn)
Field Environmental Scientist (3)

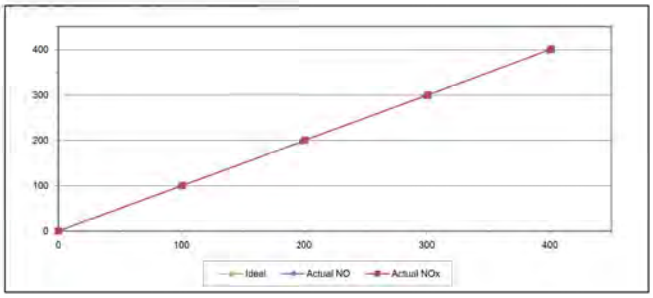
Approved By

(Mr.Sarayuth Jittranont)
Assistant General Manager

MULTIPOINT CALIBRATION REPORT

Calibration Date	4-Jan-24	Equipment Name	NOx Analyzer
Manufacturer	HORIBA	Model	APNA-370
Serial No.	U8AOEAGK	Equipment ID	RYG_FS0551
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	55.88	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS						
	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	Error NOx	%Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10	0.10
1	100.00	99.00	-1.00	-1.00	101.00	1.00	1.00
2	200.00	198.40	-1.60	-0.80	201.30	1.30	0.65
3	300.00	298.40	-1.60	-0.53	301.20	1.20	0.40
4	400.00	398.50	-1.50	-0.38	401.30	1.30	0.33
AVERAGE (%)				-0.52			0.50



Calibrated By

(Mr.Jirawut Sakarn)
Field Environmental Scientist (3)

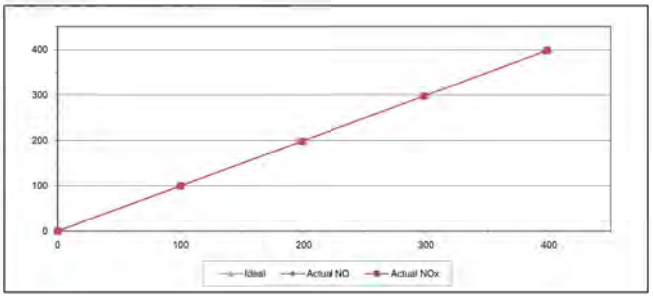
Approved By

(Mr.Sarayuth Jittranont)
Assistant General Manager

MULTIPOINT CALIBRATION REPORT

Calibration Date	4-Jan-24	Equipment Name	NOx Analyzer
Manufacturer	Teledyne API	Model	T200
Serial No.	2197	Equipment ID	RYG_FS0255
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	55.88	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS						
	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	Error NOx	%Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10	0.10
1	100.00	99.60	-0.40	-0.40	100.10	0.10	0.10
2	200.00	198.00	-2.00	-1.00	198.50	-1.50	-0.75
3	300.00	297.30	-2.70	-0.90	298.70	-1.30	-0.43
4	400.00	396.40	-3.60	-0.90	398.50	-1.50	-0.38
AVERAGE (%)				-0.62			-0.27



Calibrated By

(Mr.Jirawut Sakarn)
Field Environmental Scientist (3)

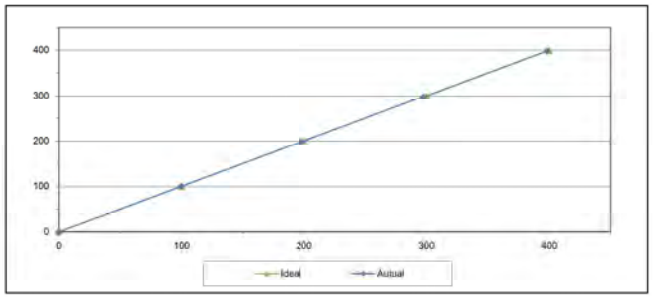
Approved By

(Mr.Sarayuth Jittranont)
Assistant General Manager

MULTIPOINT CALIBRATION REPORT

Calibration Date	4-Jan-24	Equipment Name	SO2 Analyzer
Manufacturer	HORIBA	Model	APSA-370
Serial No.	1092NYKM	Equipment ID	RYG_FS0271
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	56.3	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS			
	Ideal	Autua	Error	%Error
ZERO	0.00	0.10	0.10	0.10
1	100.00	99.50	-0.50	-0.50
2	200.00	198.20	-1.80	-0.90
3	300.00	297.60	-2.40	-0.80
4	400.00	398.30	-1.70	-0.42
AVERAGE (%)				-0.50



Calibrated By

(Mr.Jirawut Sakarn)
Field Environmental Scientist (3)

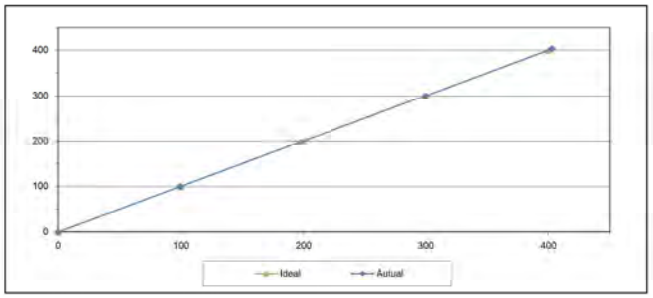
Approved By

(Mr.Sarayuth Jittranont)
Assistant General Manager

MULTIPOINT CALIBRATION REPORT

Calibration Date	4-Jan-24	Equipment Name	SO2 Analyzer
Manufacturer	HORIBA	Model	APSA-370
Serial No.	XL29Y85B	Equipment ID	RYG_FS0462
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	56.3	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS			
	Ideal	Autual	Error	%Error
ZERO	0.00	0.10	0.10	0.10
1	100.00	99.10	-0.90	-0.90
2	200.00	198.10	-1.90	-0.95
3	300.00	299.90	-0.10	-0.03
4	400.00	403.20	3.20	0.80
AVERAGE (%)				-0.20



Calibrated By

(Mr.Jirawut Sakarn)
Field Environmental Scientist (3)

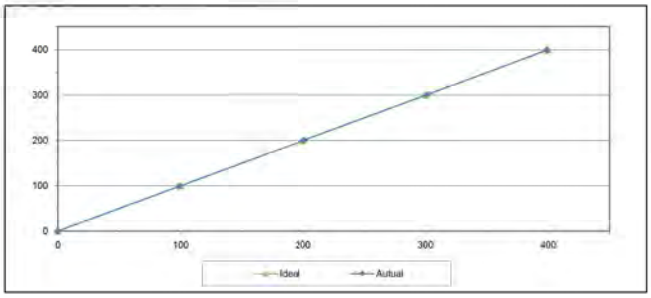
Approved By

(Mr.Sarayuth Jittranont)
Assistant General Manager

MULTIPOINT CALIBRATION REPORT

Calibration Date	4-Jan-24	Equipment Name	SO2 Analyzer
Manufacturer	HORIBA	Model	APSA-370
Serial No.	PAUY0T7A	Equipment ID	RYG_FS0458
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	58.3	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS			
	Ideal	Autua	Error	%Error
ZERO	0.00	0.10	0.10	0.10
1	100.00	98.90	-1.10	-1.10
2	200.00	201.00	1.00	0.50
3	300.00	302.30	2.30	0.77
4	400.00	398.80	-1.20	-0.30
AVERAGE (%)				-0.01



Calibrated By

(Mr.Jirawut Sakarn)
Field Environmental Scientist (3)

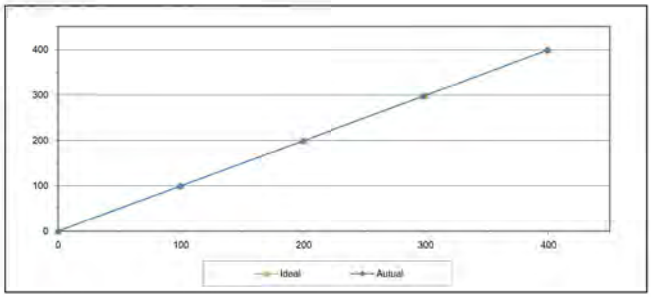
Approved By

(Mr.Sarayuth Jittranont)
Assistant General Manager

MULTIPOINT CALIBRATION REPORT

Calibration Date	4-Jan-24	Equipment Name	SO2 Analyzer
Manufacturer	Teledyne API	Model	T100
Serial No.	1772	Equipment ID	RYG_FS0254
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	58.3	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS			
	Ideal	Autual	Error	%Error
ZERO	0.00	0.05	0.05	0.05
1	100.00	99.10	-0.90	-0.90
2	200.00	199.60	-0.40	-0.20
3	300.00	297.50	-2.50	-0.83
4	400.00	398.90	-1.10	-0.28
AVERAGE (%)				-0.43



Calibrated By

(Mr.Jirawut Sakarn)
Field Environmental Scientist (3)

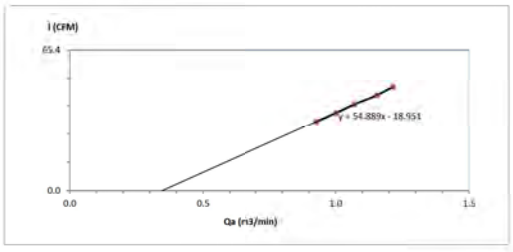
Approved By

(Mr.Sarayuth Jittranont)
Assistant General Manager

High Volume Air Sampler Calibration Worksheet

Project Site :	Global Power Synergy Public Company Limited	Barometric Pressure (mm Hg) :	750
Calibrate Location :	ห้องประชุมมิตรน่าน2	Temperature (°C) :	30
Calibrate Date :	22-Mar-24	High Volume ID :	RYG_FS0186
CalibrationSheet No.:	C-220324-RYG_FS0186	High Volume Model :	TE-5009X
Calibrator ID:	RYG_FS0206	High Volume S/N :	4794
Calibrator Model :	TE-5028A	Calibrator Slope :	0.92345
Calibrator S/N :	1543	Calibrator Intercept :	-0.0093

Test No.	Delta H_2O (Inch)	Qa (m^3/min)	I : Chart (CFM)	Linear Regression
1	1.8	0.928	32	Slope : 54.8887
2	2.1	1.002	36	Intercept : -18.9506
3	2.4	1.070	40	Correlation Coefficient : 0.9990
4	2.8	1.155	44	
5	3.1	1.215	48	



Calibrated by ชัชชัย

(Mr.Chatchai Sukpia)
Field Scientist(1)

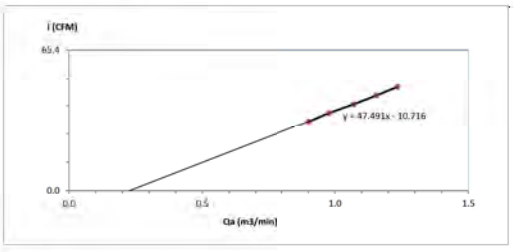
Approved by :

(Mr. Noppong Juntarupan)
Enviro Field Coordinator Scientist (3)

High Volume Air Sampler Calibration Worksheet

Project Site :	Global Power Synergy Public Company Limited	Barometric Pressure (mm Hg) :	750
Calibrate Location :	ห้องสำนักงานน่าน	Temperature (°C) :	30
Calibrate Date :	22-Mar-24	High Volume ID :	RYG_FS0192
CalibrationSheet No.:	C-220324-RYG_FS0192	High Volume Model :	TE-5009X
Calibrator ID:	RYG_FS0206	High Volume S/N :	5331
Calibrator Model :	TE-5028A	Calibrator Slope :	0.92345
Calibrator S/N :	1543	Calibrator Intercept :	-0.0093

Test No.	Delta H_2O (Inch)	Qa (m^3/min)	I : Chart (CFM)	Linear Regression
1	1.7	0.902	32	Slope : 47.4911
2	2.0	0.970	36	Intercept : -10.7158
3	2.4	1.070	40	Correlation Coefficient : 0.9996
4	2.8	1.155	44	
5	3.2	1.234	48	



Calibrated by ชัชชัย

(Mr.Chatchai Sukpia)
Field Scientist(1)

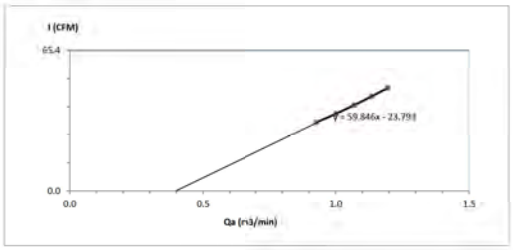
Approved by :

(Mr. Noppong Juntarupan)
Enviro Field Coordinator Scientist (3)

High Volume Air Sampler Calibration Worksheet

Project Site :	Global Power Synergy Public Company Limited	**Barometric Pressure (mm Hg) :**	758
Calibrate Location :	วัดยางลุ่มหม้อ	**Temperature (°C) :**	30
Calibrate Date :	22-Mar-24	**High Volume ID :**	RYG_FS0189
CalibrationSheet No.:	C-220324-RYG_FS0189	**High Volume Model :**	TE-5009X
Calibrator ID:	RYG_FS0206	**High Volume S/N :**	4797
Calibrator Model :	TE-5028A	**Calibrator Slope :**	0.92345
Calibrator S/N :	1543	**Calibrator Intercept :**	-0.0095

Test No.	Delta H_2O (inch)	Qa (m^3/min)	I : Chart (CFM)	Linear Regression
1	1.8	0.928	32	Slope : 59.8459
2	2.1	1.002	36	Intercept : -23.7929
3	2.4	1.070	40	Correlation Coefficient : 0.9993
4	2.7	1.135	44	
5	3.0	1.195	48	



Calibrated by: (Mr.Chatchai Sukpia) Field Scientist(1)

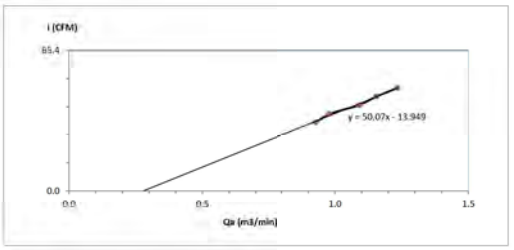
Approved by : (Mr. Noppong Juntarupan) Enviro Field Coordinator Scientist (3)

FORM NO.: F 06-074 REVISION NO.:2 ISSUE DATE: 20/11/23

High Volume Air Sampler Calibration Worksheet

Project Site :	Global Power Synergy Public Company Limited	**Barometric Pressure (mm Hg) :**	758
Calibrate Location :	วัดยางบอล	**Temperature (°C) :**	30
Calibrate Date :	22-Mar-24	**High Volume ID :**	RYG_FS0667
CalibrationSheet No.:	C-220324-RYG_FS0667	**High Volume Model :**	TE-5009X
Calibrator ID:	RYG_FS0206	**High Volume S/N :**	6266
Calibrator Model :	TE-5028A	**Calibrator Slope :**	0.92345
Calibrator S/N :	1543	**Calibrator Intercept :**	-0.0095

Test No.	Delta H_2O (inch)	Qa (m^3/min)	I : Chart (CFM)	Linear Regression
1	1.8	0.928	32	Slope : 50.0705
2	2.0	0.978	36	Intercept : -13.9485
3	2.5	1.092	40	Correlation Coefficient : 0.9943
4	2.8	1.155	44	
5	3.2	1.234	48	



Calibrated by: (Mr.Chatchai Sukpia) Field Scientist(1)

Approved by : (Mr. Noppong Juntarupan) Enviro Field Coordinator Scientist (3)

FORM NO.: F 06-074 REVISION NO.:2 ISSUE DATE: 20/11/23

Sartorius (Thailand) Co., Ltd.
129 Rama 9 Road, Huaykwang, Huaykwang, Bangkok 10310
Tel: +66 2643 8361-6 , e-mail: service.thailand@sartorius.com

NSC-TISI-TIS 17025
CALIBRATION 0426

SARTORIUS

Certificate of Calibration

Model Number : LA130S-F
Description : Analytical Balance
Serial Number : 25409664
ID No. : RYG_EN0001
Manufacturer : Sartorius

Certificate No. : 24BCI0068
Issued Date : Friday, February 23, 2024
Reference No. : 229196
Page No. : 1 Of 2

REVIEW BY Thanitat
APPROVED BY
NEXT CAL. DATE 22/02/2025

Customer Name : ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
616/10 Moo 5 T.Maenam Khu, A.Pluak Daeng, Rayong 21140, Thailand.

Calibrated Place : ALS Laboratory Group (Thailand) Co., Ltd.(Balance Room)
616/10 Moo 5 T.Maenam Khu, A.Pluak Daeng, Rayong 21140, Thailand.

Calibrated By : Mr.Chonchai Inthana
Calibration Date : Thursday, February 22, 2024

Calibration Procedure No. : This calibration was conducted by
Using in-house calibration procedure number (WI-003)
Based on UKAS LAB 14 : 2019

Metrological data :
Capacity : 150 g Readability : 0.0001 g

Ambients Conditions:
Temperature : 23.6 °C ± 5.0 °C
Humidity : 54.0 % RH ± 10.0 % RH
Pressure ± ___

Reasons for calibration
☐ New Installation ☐ Service / Repaired ☑ Re-calibration/ Maintenance

Equipment Condition: ☑ Good Operate ☐ Fair

Measurement Method UKAS Publication Ref :Lab 14

The measurement uncertainty stated is the expended uncertainty which is obtained from the standard uncertainty multiplied by the coverage factor (k=2) to provide a level of confidence of approximately 95%. It is determined in accordance with the Guide to Expression of Uncertainty in Measurement (GUM). The calibration certificate documents the traceability to National Standards, which realise the unit of measurement according to the International Standard System of Units (SI). Report of Tolerance came form list of Sartorius Metrological Specifications.

Traceability:

Model Number	Description	Traceability	Cetificate No.	Due Date
YCS011-522-00	Sartorius weight set 1mg - 5000g E2,YCS011-522-00	TCS	M2308197S	23-Aug-2025
MHB-382SD	Humidity/Barometer/Temp Lutron MHB-382SD	DKSH	C19231845	23-Aug-2024

This certificate relate and apply this equipment only.
This certificate may not be reproduced other than in full except with the prior written approval of the Verification Operation Division Sartorius (Thailand) Co., Ltd.

Mr.chonchai Intrhana(Technical Manager)

STAMP

SOP FM 33 03 February 2022

Sartorius (Thailand) Co., Ltd.
129 Rama 9 Road, Huaykwang, Huaykwang, Bangkok 10310
Tel: +66 2643 8361-6 Fax: +66 2643-8367, e-mail: service.thailand@sartorius.com

SARTORIUS

Certificate of Calibration

Model Number : LA130S-F
Description : Analytical Balance
Serial Number : 25409664
ID No. : RYG_EN0001
Manufacturer : Sartorius

Certificate No. : 24BCI0068
Issued Date : Friday, February 23, 2024
Reference No. : 229196
Page No. : 2 of 2

Calibration Results : Without Adjustment

Repeatability

The reproducibility is the ability of a weighing instrument to display nearly identical reaouts under constant test conditions when the same load within a measurement series is placed repeatedly on the weighing pan in the same manner. The standard deviation is used to express reproducibility quantitatively.

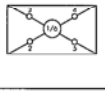
Nominal Value : (Low Load) 10 g	10.0000	99.9999
	10.0000	100.0000
Tolerance	10.0000	100.0001
0.0001 g	10.0000	100.0001
	9.9999	100.0000
Nominal Value : (High Load)	10.0000	100.0001
100 g	10.0000	100.0000
Tolerance	10.0000	100.0001
0.0001 g	9.9999	100.0002
	9.9999	100.0001
Standard Deviation	0.00005	0.00008

Eccentricity (Off-center loading error)

The off-center loading error is yielded by the difference between the readout of the load, i.e. 1/3 or 1/4 of maximim capacity, placed in the middle of the weighing pan and between each of four additional measurement points (positions defined according to OIML R76).

Nominal value : 50 g
Tolerance *0.0004* g





	Difference
1	--
2	-0.0001
3	0.0001
4	0.0002
5	0.0000
6	-

Linearity

The linearity, also called linearity error. Describes the deviation of the characteristic curve of a weighing instrument from the linear slope.

Tolerance *0.0002* g

Nominal Value (g)	Conventional Mass Value (g)	Displayed Value (g)	Deviation (g)	Uncertainty (g)
0.01	0.0100	0.0100	0.0000	0.00020
0.05	0.0500	0.0500	0.0000	0.00021
0.1	0.1000	0.1000	0.0000	0.00021
0.5	0.5000	0.5000	0.0000	0.00021
1	1.0000	1.0000	0.0000	0.00021
2	2.0000	2.0000	0.0000	0.00021
5	5.0000	5.0000	0.0000	0.00021
10	10.0000	10.0001	0.0001	0.00024
20	20.0000	20.0001	0.0001	0.00021
100	100.0000	99.9999	-0.0001	0.00024

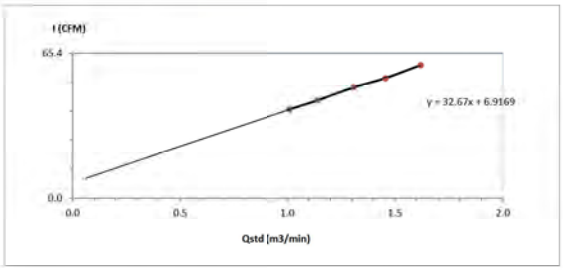
End of Report.

SOP FM 33 03 February 2022

High Volume Air Sampler Calibration Worksheet

Project Site :	Global Power Synergy Public Company Limited	**Barometric Pressure (mm Hg) :**	758
Calibrate Location :	วัดประชุมมิตรปาร์ง	**Temperature (°C) :**	30
Calibrate Date :	22-Mar-24	**High Volume ID :**	RYG_FS0173
CalibrationSheet No.:	C-220324-RYG_FS0173	**High Volume Model :**	TE-5170D
Calibrator ID:	RYG_FS0206	**High Volume S/N :**	4799
Calibrator Model :	TE-5028A	**Calibrator Slope :**	1.47433
Calibrator S/N :	1543	**Calibrator Intercept :**	-0.01503

Test No.	Delta H_2O (inch)	Q_{std} (m^3/min)	I : Chart (CFM)	Linear Regression	
1	2.2	1.0114	40	Slope :	32.6705
2	2.8	1.1391	44	Intercept :	6.9169
3	3.7	1.3072	50	Correlation Coefficient :	0.9991
4	4.6	1.4558	54		
5	5.7	1.6188	60		



Calibrated by ชัชชัย

(Mr.Chatchai Sukpia)
Field Scientist(1)

Approved by :

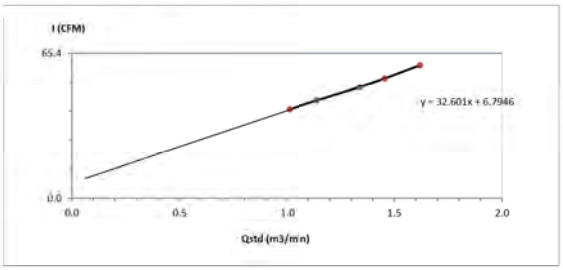
(Mr. Noppong Juntarupan)
Enviro Field Coordinator Scientist (3)

FORM NO.: F 06-073 REVISION NO.:2 ISSUE DATE: 20/11/23

High Volume Air Sampler Calibration Worksheet

Project Site :	Global Power Synergy Public Company Limited	**Barometric Pressure (mm Hg) :**	758
Calibrate Location :	บ้านสำนักมะม่วง	**Temperature (°C) :**	30
Calibrate Date :	22-Mar-24	**High Volume ID :**	RYG_FS0393
CalibrationSheet No.:	C-220324-RYG_FS0393	**High Volume Model :**	TE-5170D
Calibrator ID:	RYG_FS0206	**High Volume S/N :**	5682
Calibrator Model :	TE-5028A	**Calibrator Slope :**	1.47433
Calibrator S/N :	1543	**Calibrator Intercept :**	-0.01503

Test No.	Delta H_2O (inch)	Q_{std} (m^3/min)	I : Chart (CFM)	Linear Regression	
1	2.2	1.0114	40	Slope :	32.6006
2	2.8	1.1391	44	Intercept :	6.7946
3	3.9	1.3400	50	Correlation Coefficient :	0.9989
4	4.6	1.4558	54		
5	5.7	1.6188	60		



Calibrated by ชัชชัย

(Mr.Chatchai Sukpia)
Field Scientist(1)

Approved by :

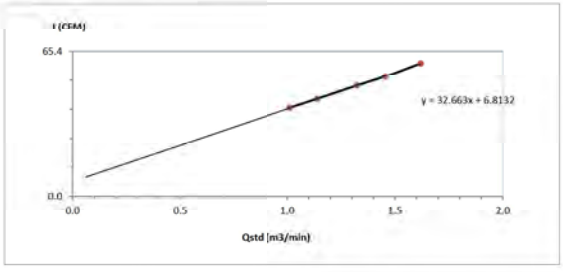
(Mr. Noppong Juntarupan)
Enviro Field Coordinator Scientist (3)

FORM NO.: F 06-073 REVISION NO.:2 ISSUE DATE: 20/11/23

High Volume Air Sampler Calibration Worksheet

Project Site :	Global Power Synergy Public Company Limited	**Barometric Pressure (mm Hg) :**	758
Calibrate Location :	วัดป่ากลุกหญ้า	**Temperature (°C) :**	30
Calibrate Date :	22-Mar-24	**High Volume ID :**	RYG_FS0662
CalibrationSheet No.:	C-220324-RYG_FS0662	**High Volume Model :**	TE-5009X
Calibrator ID:	RYG_FS0206	**High Volume S/N :**	6259
Calibrator Model :	TE-5028A	**Calibrator Slope :**	1.47433
Calibrator S/N :	1543	**Calibrator Intercept :**	-0.01503

Test No.	Delta H_2O (inch)	Q_{std} (m^3/min)	I : Chart (CFM)	Linear Regression	
1	2.2	1.0114	40	Slope :	32.6631
2	2.8	1.1391	44	Intercept :	6.8132
3	3.8	1.3245	50	Correlation Coefficient :	0.9995
4	4.6	1.4558	54		
5	5.7	1.6188	60		



Calibrated by ชัชชัย

(Mr.Chatchai Sukpia)
Field Scientist(1)

Approved by :

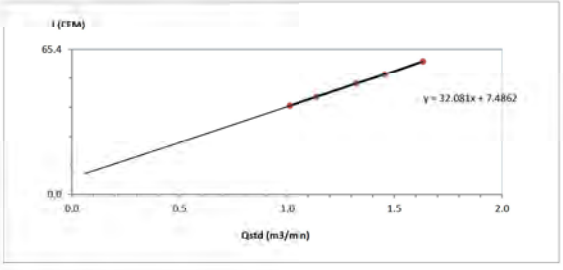
(Mr. Noppong Juntarupan)
Enviro Field Coordinator Scientist (3)

FORM NO.: F 06-073 REVISION NO.:2 ISSUE DATE: 20/11/23

High Volume Air Sampler Calibration Worksheet

Project Site :	Global Power Synergy Public Company Limited	**Barometric Pressure (mm Hg) :**	758
Calibrate Location :	วัดบางขุด	**Temperature (°C) :**	30
Calibrate Date :	22-Mar-24	**High Volume ID :**	RYG_FS0663
CalibrationSheet No.:	C-220324-RYG_FS0663	**High Volume Model :**	TE-5009X
Calibrator ID:	RYG_FS0206	**High Volume S/N :**	6260
Calibrator Model :	TE-5028A	**Calibrator Slope :**	1.47433
Calibrator S/N :	1543	**Calibrator Intercept :**	-0.01503

Test No.	Delta H_2O (inch)	Q_{std} (m^3/min)	I : Chart (CFM)	Linear Regression	
1	2.2	1.0114	40	Slope :	32.0807
2	2.8	1.1391	44	Intercept :	7.4862
3	3.8	1.3245	50	Correlation Coefficient :	0.9999
4	4.6	1.4558	54		
5	5.8	1.6329	60		



Calibrated by ชัชชัย

(Mr.Chatchai Sukpia)
Field Scientist(1)

Approved by :

(Mr. Noppong Juntarupan)
Enviro Field Coordinator Scientist (3)

FORM NO.: F 06-073 REVISION NO.:2 ISSUE DATE: 20/11/23

JIRANATEE ASSOCIATES CO.,LTD.
Jiranatee Associates Co.,Ltd.
63/14-15, 67/35-36
Petchkasem 7,7/1, Rd. Watthana, Bangkokyai,
Bangkok 10600(Thailand)
Tel: +6608808812
Mobile: +6686399543
E-mail: jnac-calibration@jiranatee.com
Web site: www.jiranatee.com

Accredited calibration laboratory
ISO/IEC 17025:2017
NSC-TISI-TIS 17025
CALIBRATION 0367

Air speed measurement laboratory
Calibration services department.

REVIEW BY Wanalom P.
APPROVED BY
NEXT CAL. DATE 10/8/24

Certificate Number
CL-019-66

CERTIFICATE OF CALIBRATION

MEASUREMENT ITEM	: Cup anemometer	
MANUFACTURER	: Novalynx	
MODEL/TYPE	: Sensor: WS-021	
	Data logger: 200-WS-25LB	
SERIAL NUMBER	: Sensor:-	
	Data logger: A5374	
ID NUMBER	: WG_FS0412	
CONDITION AS-RECEIVED	: Used item	
CUSTOMER	: ALS laboratory group (Thailand) Co., Ltd. 104 Phatthanakan 40, Phatthanakan Rd, Khwaeng Suan Luang, Khet Suan Luang, Bangkok 10250 Thailand.	
RECEIVED DATE	: 27 Jan 2023	
MEASUREMENT DATE	: 10 Feb 2023	
ISSUE DATE	: 10 Feb 2023	

ENVIRONMENTAL CONDITIONS:
Ambient condition in the laboratory are as follow:

Temperature	: 23.0 ± 3.0	°C
Relative Humidity	: 55.0 ± 15.0	%RH
Atmospheric Pressure	: 1010 ± 10	hPa

PLACE OF CALIBRATION : Eiffel-type wind tunnel of Jiranatee Associates Co., Ltd.

CALIBRATION CONDITIONS

Wind tunnel cross-section area[1]	900	cm^2
Win direction frontal area[2]	100	cm^2
Diameter of mounting pipe[3]	-	mm
Blockage ratio of test object[4]	0.111	[-]

Preconditioning : 24 hours at ambient conditions.
Measurement Condition : The average values during measurement are (23.5) °C, (49.7) %RH and (1010.3) hPa.

TABULATION OF RESULTS:
The table on next page give the measured values.

Calibrated by:
☑ Mr. Sorawit Thachalad
☐ Miss Jittragorn Lertsomphol

Approved signatory:
Mr. Parinya Booncharoen
Calibration Department Manager

Calibration procedure:
The cup anemometer was calibrated against standard air velocity transducer model: 8455-B2 and pilot tube with precision differential pressure meter model: DPM2500 in an close test section of Eiffel-type wind tunnel with 900 cm^2 cross test section area. The WI-CL-007 based on IEC 61400-12-1, Wind energy generation systems – Part 12-1: Power performance measurements of electricity producing wind turbines, March 2017 was used as a calibration guideline.

Traceability:
This certificate provides a traceability of The measurement to recognized the national standards, and to realization of the international system of units (SI) through the NIMT (National Metrology Institute of Thailand) via Certificate number: MW-0052-21 and MW-0066-22

Uncertainty of Measurement:
The reported uncertainty of measurement is based on the standard uncertainty multiplied by a coverage factor k=2, Which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty has been determined in accordance with the GUM 'Evaluation of measurement data - Guide to the expression of uncertainty in measurement'

Remark:
[1] Nozzle cross-section area of the wind tunnel
[2] Projected cross-section area of the tested object include mounting pipe
[3] Diameter of mounting pipe
[4] Ratio [2] to [1]

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

MEASUREMENT RESULTS [5]

The cup anemometer, Unit Under Calibration (UUC) was exercise at 10 m/s for 5 minutes prior to calibration being performed. The standard air velocity 0.5 m/s to 5 m/s was calculated by a standard air velocity transducer and above 5 m/s to 30 m/s was calculated by a pitot tube with precision differential pressure meter which was installed 40 mm and 300 mm respectively away from wind tunnel nozzle, UUC was installed at center of the test section. The calibration was carried out under both rising and falling air velocity in the range of 1 m/s to 16 m/s at calibration interval of 1 m/s. The results of calibration and associated measurement uncertainties are reported in the table below.

v_{std}[2] (m/s)	Temp. wind tunnel (°C)	Temp. room (°C)	v_{uuc}[3] (m/s)	Error (m/s)	U (k=2) (m/s)
0.981	23.52	23.50	0.8	-0.2	0.15
2.039	23.46	23.50	1.8	-0.2	0.16
3.040	23.50	23.50	2.9	-0.2	0.17
4.144	23.56	23.50	3.9	-0.2	0.20
5.00	23.38	23.50	4.8	-0.2	0.19
5.98	23.56	23.50	5.8	-0.2	0.17
7.05	23.26	23.50	6.9	-0.2	0.18
8.15	23.50	23.50	7.9	-0.2	0.19
9.09	23.30	23.50	8.9	-0.2	0.19
10.09	23.50	23.50	9.9	-0.2	0.20
11.14	23.24	23.50	11.0	-0.2	0.21
12.13	23.36	23.50	12.0	-0.2	0.21
13.18	23.32	23.50	13.0	-0.2	0.21
14.26	23.18	23.50	14.0	-0.2	0.22
15.21	23.30	23.50	14.9	-0.3	0.24
16.28	23.12	23.50	16.1	-0.2	0.24

Remark:
[1] Calibration results only count for the tested circumstances and environmental conditions during which calibration took place
[2] Velocity of standard
[3] Velocity of Unit Under Calibration

PHOTO OF CALIBRATION SET-UP



Calibration set-up of the cup anemometer calibration in the wind tunnel of Jiranatee Associates Co., Ltd. The cup anemometer shown may differ from the calibrated one. Remark: The proportion of the set- up is not true to scale due to imaging geometry.

End of Certificate of Calibration

JIRANATEE ASSOCIATES CO.,LTD.
Jiranatee Associates Co.,Ltd.
63/14-15, 67/35-36
Petchkasem 7,7/1, Rd. Watthana, Bangkokyai,
Bangkok 10600(Thailand)
Tel: +6608808812
Mobile: +6686399543
E-mail: jnac-calibration@jiranatee.com
Web site: www.jiranatee.com

Accredited calibration laboratory
ISO/IEC 17025:2017
NSC-TISI-TIS 17025
CALIBRATION 0367

Air speed measurement laboratory
Calibration services department.

Certificate Number
CL-017-66

CERTIFICATE OF CALIBRATION

MEASUREMENT ITEM	: Wind Direction Sensor	
MANUFACTURER	: Novalynx	
MODEL/TYPE	: Sensor: WS-020	
	Data logger: 200-WS-25LB	
SERIAL NUMBER	: Sensor:-	
	Data logger: A5374	
ID NUMBER	: RYG_FS0412	
CONDITION AS-RECEIVED	: Used item	
CUSTOMER	: ALS laboratory group (Thailand) Co., Ltd. 104 Phatthanakan 40, Phatthanakan Rd, Khwaeng Suan Luang, Khet Suan Luang, Bangkok 10250 Thailand.	
RECEIVED DATE	: 27 Jan 2023	
MEASUREMENT DATE	: 10 Feb 2023	
ISSUE DATE	: 10 Feb 2023	

ENVIRONMENTAL CONDITIONS:
Ambient condition in the laboratory are as follow:

Temperature	: 23.0 ± 3.0	°C
Relative Humidity	: 55.0 ± 15.0	%RH
Atmospheric Pressure	: 1010± 10	hPa

PLACE OF CALIBRATION : Eiffel-type wind tunnel of Jiranatee Associates Co., Ltd.

CALIBRATION CONDITION

Wind tunnel cross-section area[1]	900	cm^2
Win direction frontal area[2]	129	cm^2
Diameter of mounting pipe[3]	-	mm
Blockage ratio of test object[4]	0.143	[-]

Preconditioning : 24 hours at ambient conditions.
Measurement Condition : The average values during measurement are (23.9)°C, (50.6) %RH and (1011.8) hPa.

TABULATION OF RESULTS:
The table on next page give the measured values.

Calibrated by:
☑ Mr. Sorawit Thachalad
☐ Miss Jittragorn Lertsomphol

Approved signatory:
Mr. Parinya Booncharoen
Calibration Department Manager

Calibration procedure:
The wind direction sensor was calibrated against Standard Rotary Encoder, model: AV-600M3-DM04-P3-5-U0 in an close test section of Eiffel-type wind tunnel with 900 cm² cross test section area. The WI-CL-008 based on IEC 61400-12-1, Wind energy generation systems – Part 12-1: Power performance measurements of electricity producing wind turbines, March 2017 was used as a calibration guideline.

Traceability:
This certificate provides a traceability of The measurement to recognized the national standards, and to realization of the international system of units (SI) through the NIMT (National Metrology Institute of Thailand) via Certificate number: DA-0043-22

Uncertainty of Measurement:
The reported uncertainty of measurement is based on the standard uncertainty multiplied by a coverage factor k=2, Which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty has been determined in accordance with the GUM 'Evaluation of measurement data - Guide to the expression of uncertainty in measurement'

Remark:
[1] Nozzle cross-section area of the wind tunnel
[2] Projected cross-section area of the tested object include mounting pipe
[3] Diameter of mounting pipe
[4] Ratio [2] to [1]

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

MEASUREMENT RESULTS [5]

The wind direction sensor was calibrated against standard rotary encoder by comparison method. During calibration, the measurement was carried out at 45° intervals in clockwise and counterclockwise directions after offset adjustment has been made. The flow speed of wind tunnel (usually 5 m/s) is kept constant while the sensor is rotated around its vertical axis. The results of calibration and associated measurement uncertainties are reported in the table below.

Air speed m/s	D'_{std} Degree (°)	D'_{uuc} Degree (°)	Error Degree (°)	U (k=2) Degree (°)
4.98	0.000	0	0	0.58
	45.000	41	-4	0.58
	90.000	87	-3	0.74
	135.001	132	-3	0.74
	180.000	178	-2	0.74
	225.000	227	3	0.58
	270.000	274	4	0.58
	315.000	320	5	0.58

Remark:
[1] Calibration results only count for the tested circumstances and environmental conditions during which calibration took place
[2] Direction of standard
[3] Direction of Unit Under Calibration

End of Certificate of Calibration

Jiranatee Associates Co., Ltd.

SITHIPORN ASSOCIATES CO., LTD.
CALIBRATION LABORATORY
451-451/1 Sirinthorn Road, Bangbumru, Bangplud, Bangkok, 10700 Thailand
Tel. +66 2433 8331 Email : calibration@sithiphorn.com

Calibration Certificate

Equipment : SOUND CALIBRATOR
Manufacturer : RION
Model : NC-75
Serial No.: 35002736
ID No.: RYG_FS0496

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location : -
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

REVIEW BY Nmakorn P.
APPROVED BY
NEXT CAL DATE 25/1/25

Received Date : 19 JANUARY 2024
Calibration Date : 26 JANUARY 2024
Date of Issue : 29 JANUARY 2024

Calibrated by : Nathakorn Pisutpaisan

Approved by : T. Petch.
(Thanakul Petchurai)

This certificate is issued in accordance with the requirements of ISO/IEC 17025 standard, may not be reproduced other than in full, except with the prior written approval of the head of Calibration Laboratory.

SITHIPORN ASSOCIATES CO., LTD.
CALIBRATION LABORATORY
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Tel. +66 2433 8331 Email : calibration@sithiphorn.com

Calibration Procedure : CP-AC-03

Calibration Method :
This equipment was calibrated by follow on IEC-60942-2003 Standard.
The sound pressure level, frequency and total distortion of the sound calibrator was measured using the reference microphone.

Condition of this result of calibration :
1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33511B	MY52302742	EF-0010-23	07-FEB-24
Digital Multimeter	33461A	MY53220104	EEL.BP 30/0266	13-FEB-24
Digital Multimeter	33461A	MY53220076	EEL.BP 30/0267	13-FEB-24
Digital Multimeter	33461A	MY60024273	EEL.BP 31/0266	14-FEB-24
Programmable Attenuator	MAT-1070	62100114	EF-0011-23	08-FEB-24
Condenser Microphone	4180	2977900	AA-1001-23	14-FEB-24
Measuring Amplifier	NA-42KAI	34560495	AA-3002-23	14-FEB-24
Audio Analyzer	AVR-3360A	V744B6069	EF-0012-23	10-FEB-24

2. This result of calibration was found accurate as shown on date and place of calibration for this calibrated item only.
3. This certificate is traceable to the international system of unit maintained at :
   3.1 National Institute of Metrology (Thailand).
   3.2 Thailand Institute of Scientific and Technological Research (TISTR).

T. Petch.

SITHIPORN ASSOCIATES CO., LTD.
CALIBRATION LABORATORY
451-451/1 Sirinthorn Road, Bangbumru, Bangplud, Bangkok, 10700 Thailand
Tel. +66 2433 8331 Email : calibration@sithiphorn.com

Result of calibration :

1. Sound pressure level

Specified sound pressure level (dB)	Measured value (dB)	Deviated value (dB)	Uncertainty (dB)	Acceptance limit (dB)
94	93.98	-0.02	0.14	0.40

2. Frequency

Specified Frequency (Hz)	Measured value (Hz)	Deviated value (%)	Uncertainty (%)	Acceptance limit (%)
1000	1000.0	0.0	0.1	1.0

3. Total distortion

Measured value (%)	Uncertainty (%)	Acceptance limit (%)
0.83	0.10	3.0

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor $k = 2$ or any value following calculation,providing a lavel of confidence of approximately 95 %

End of Calibration Certificate

T. Petch.

SITHIPORN ASSOCIATES CO., LTD.
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Tel. +66 2433 8331 Email : calibration@sithiphorn.com

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42A / Microphone UC-52 / Preamplifier NH-24
Serial No.: 00623392 / 198639 / 26420
ID No.: RYG_FS0617

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location : -
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

REVIEW BY Nmakorn P.
APPROVED BY
NEXT CAL DATE 11/1/26

Received Date : 05 JANUARY 2024
Calibration Date : 12-15 JANUARY 2024
Date of Issue : 16 JANUARY 2024

Calibrated by : Nathakorn Pisutpaisan

Approved by : T. Petch.
(Thanakul Petchurai)

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NSC-TISI-TIS 17025 CALIBRATION 0394

Cert. No. : ACL24033
Job No. : VC67AC0052
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tess of frequency weighting with Anechoic chamber and Reference Standard Instruments.
For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-23	07-FEB-24
Waveform Generator	33511B	MY52302742	EF-0010-23	07-FEB-24
Digital Multimeter	34461A	MY53220104	EEL.BP 30/0266	13-FEB-24
Digital Multimeter	34461A	MY53220076	EEL.BP 29/0266	13-FEB-24
Digital Multimeter	3446 1A	MY60024273	EEL.BP 31/0266	14-FEB-24
Programmable Attenuator	MAT-1070	62100114	EF-0011-23	08-FEB-24
Condenser Microphone	4180	2977900	AA-1001-23	14-FEB-24
Measuring Amplifier	NA-42KAI	34560495	AA-3002-23	14-FEB-24

2. This result of calibration was found accurate as shown on date and place of calibration for this calibrated item only.
3. This certificate is traceable to the international system of unit maintained at :
   3.1 National Institute of Metrology (Thailand).
   3.2 Thailand Institute of Scientific and Technological Research (TISTR).

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NSC-TISI-TIS 17025 CALIBRATION 0394

Cert. No. : ACL24033
Job No. : VC67AC0052
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	-	1.0
5. Frequency and time weightings at 1 kHz	0.2	0.2
6. Long - term stability	0.1	0.1
7. Level linearity on the reference level range	0.2	0.3
8. Level linearity including the level range control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

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NSC-TISI-TIS 17025 CALIBRATION 0394

Cert. No. : ACL24033
Job No. : VC67AC0052
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.98)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
14.8

2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency Weighting	Measured value (dB)
A - weight	13.8
C - weight	20.6
Flat	26.1

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 84 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.1	0.1	0.1	± 1.5
1000	0.0	0.0	0.0	± 1.0
8000	1.2	1.3	1.3	±5.0

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Cert. No. : ACL24033
Job No. : VC67AC0052
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	0.0	0.0	±2.0
125	0.0	0.1	0.1	±1.5
250	0.0	0.0	0.0	±1.5
500	0.0	0.1	0.0	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.1	0.0	±2.0
4000	0.0	0.0	0.0	±3.0
8000	0.0	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.2
C - weight	94.0	94.0	0.0	± 0.2
Flat	94.0	94.0	0.0	± 0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	94.0	0.0	± 0.1
Slow	94.0	94.0	0.0	± 0.1
Leq	94.0	94.0	0.0	± 0.1

6. Long - term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.1	0.1	± 0.3

Cert. No. : ACL24033
Job No. : VC67AC0052
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	± 1.1
136.0	136.0	0.0	± 1.1
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 1.1
133.0	133.0	0.0	± 1.1
132.0	132.0	0.0	± 1.1
131.0	131.0	0.0	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.0	0.0	± 1.1
114.0	114.0	0.0	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.0	0.0	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.0	0.0	± 1.1
54.0	54.0	0.0	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 1.1
39.0	39.0	0.0	± 1.1
34.0	34.0	0.0	± 1.1
30.0	30.0	0.0	± 1.1
29.0	29.0	0.0	± 1.1
28.0	28.0	0.0	± 1.1
27.0	27.1	0.1	± 1.1
26.0	26.1	0.1	± 1.1
25.0	25.1	0.1	± 1.1

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Cert. No. : ACL24033
Job No. : VC67AC0052
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Auto	94.0	94.0	0.0	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	108.0	0.0	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.1	0.1	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.1	0.1	±1.0

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Lcpeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±3.0
One	136.4	136.0	-0.4	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±2.0
Positive half cycle	135.4	135.1	-0.3	±2.0
Negative half cycle	135.4	135.1	-0.3	±2.0

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Cert. No. : ACL24033
Job No. : VC67AC0052
Pages : 8 of 8

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.7	89.7	0.0	±1.5

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	137.0	137.0	0.0	±0.3

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor $k = 2$ or any value following calculation,providing a lavel of confidence of approximately 95 %

End of Calibration Certificate

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Cert. No. : ACL24036
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42A / Microphone UC-52 / Preamplifier NH-24
Serial No.: 00623395 / 198642 / 26423
ID No.: RYG_FS0020

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location : -
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

REVIEW BY Nanakorn P.
APPROVED BY
NEXT CAL. DATE 11/1/25

Received Date : 05 JANUARY 2024
Calibration Date : 12-15 JANUARY 2024
Date of Issue : 16 JANUARY 2024

Calibrated by : Nathakorn Pisutpaisan

Approved by : (Thanakul Petchurai)

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NSC-TISI-TIS 17025 CALIBRATION 0394

Cert. No. : ACL24036
Job No. : VC67AC0052
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.
For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-23	07-FEB-24
Waveform Generator	3351/B	MY52302742	EF-0010-23	07-FEB-24
Digital Multimeter	3346/A	MY53220104	EEL.BP 30/0266	13-FEB-24
Digital Multimeter	3346/A	MY53220076	EEL.BP 29/0266	13-FEB-24
Digital Multimeter	3446/A	MY60024273	EEL.BP 31/0266	14-FEB-24
Programmable Attenuator	MAT-1070	62100114	EF-0011-23	08-FEB-24
Condenser Microphone	4180	2977900	AA-1001-23	14-FEB-24
Measuring Amplifier	NA-42KAI	34560495	AA-3002-23	14-FEB-24

2. This result of calibration was found accurate as shown on date and place of calibration for this calibrated item only.
3. This certificate is traceable to the international system of unit maintained at :
   3.1 National Institute of Metrology (Thailand).
   3.2 Thailand Institute of Scientific and Technological Research (TISTR).

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SITHIPORN associates

NSC-TISI-TIS 17025 CALIBRATION 0394

Cert. No. : ACL24036
Job No. : VC67AC0052
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	-	1.0
5. Frequency and time weightings at 1 kHz	0.2	0.2
6. Long - term stability	0.1	0.1
7. Level linearity on the reference level range	0.2	0.3
8. Level linearity including the level range control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

SITHIPORN ASSOCIATES CO., LTD.
CALIBRATION LABORATORY
451-451/1 Sirinthorn Road, Bangbumru, Bangplud, Bangkok, 10700 Thailand
Tel. +66 2433 8331 Email : calibration@sithiphorn.com

SITHIPORN associates

NSC-TISI-TIS 17025 CALIBRATION 0394

Cert. No. : ACL24036
Job No. : VC67AC0052
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.98)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
14.2

2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency Weighting	Measured value (dB)
A - weight	9.9
C - weight	16.5
Flat	22.3

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 84 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.3	0.3	0.4	± 1.5
1000	0.0	0.0	0.0	± 1.0
8000	0.7	0.8	0.8	±5.0

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SITHIPORN associates

NSC-TISI-TIS 17025 CALIBRATION 0394

Cert. No. : ACL24036
Job No. : VC67AC0052
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	-0.1	0.0	±2.0
125	0.0	0.0	0.0	±1.5
250	0.0	0.0	0.0	±1.5
500	0.0	0.0	-0.1	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.0	0.0	±2.0
4000	0.0	0.0	0.0	±3.0
8000	0.0	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.2
C - weight	94.0	94.0	0.0	± 0.2
Flat	94.0	94.0	0.0	± 0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	94.0	0.0	± 0.1
Slow	94.0	94.0	0.0	± 0.1
Leq	94.0	94.0	0.0	± 0.1

6. Long - term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.3

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NSC-TISI-TIS 17025 CALIBRATION 0394

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	± 1.1
136.0	136.0	0.0	± 1.1
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 1.1
133.0	133.0	0.0	± 1.1
132.0	132.0	0.0	± 1.1
131.0	131.0	0.0	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.0	0.0	± 1.1
114.0	114.0	0.0	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.0	0.0	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.1	0.1	± 1.1
84.0	84.1	0.1	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.1	0.1	± 1.1
69.0	69.1	0.1	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.1	0.1	± 1.1
54.0	54.0	0.0	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 1.1
39.0	39.0	0.0	± 1.1
34.0	34.0	0.0	± 1.1
30.0	30.0	0.0	± 1.1
29.0	29.0	0.0	± 1.1
28.0	28.0	0.0	± 1.1
27.0	27.0	0.0	± 1.1
26.0	26.0	0.0	± 1.1
25.0	24.9	-0.1	± 1.1

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NSC-TISI-TIS 17025 CALIBRATION 0394

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Auto	94.0	94.0	0.0	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Lcpeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±3.0
One	136.4	136.1	-0.3	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.1	0.1	±2.0
Positive half cycle	135.4	135.3	-0.1	±2.0
Negative half cycle	135.4	135.3	-0.1	±2.0

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11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.7	89.7	0.0	±1.5

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	137.0	137.0	0.0	±0.3

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor $k = 2$ or any value following calculation,providing a level of confidence of approximately 95 %.

End of Calibration Certificate

R10_15_0212

CERTIFICATE OF CALIBRATION

REVIEW BY Ninakorn P.
APPROVED BY
NEXT CAL. DATE 18/8/24

ISSUED BY **Cirrus Research**

DATE OF ISSUE **18 August 2023** CERTIFICATE NUMBER **197597**

Cirrus Research
Acoustic House
Bridlington Road
Hunmanby
North Yorkshire
YO14 0PH
United Kingdom

Approved signatory
R.Thomas
Electronically signed:

doseBadge Reader : IEC 60942:2003

Instrument information

Manufacturer: Cirrus Research plc **Notes:**
Model: RC:110A
Serial number: 76062
Class: 2

Test summary

Date of calibration: 18 August 2023

The doseBadge reader detailed above has been calibrated to the published data as described in the operating manual and in the half-inch configuration. The procedures and techniques used are as described in IEC60942_2003 Annex B – Periodic Tests and three determinations of the sound pressure level, frequency and total distortion were made.

The sound pressure level was measured using a WS2F condenser microphone type MK:224 manufactured by Cirrus Research plc.

The results have been corrected to the reference pressure of 101.33 kPa using the manufacturer's data.

The doseBadge Reader has been shown to conform to the Class 2 requirements for periodic testing, described in Annex B of IEC 60942:2003 for the sound pressure level(s) and frequency(ies) stated, for the environmental conditions under which the tests were performed.

However, as public evidence was not available, from a testing organisation responsible for pattern approval, to demonstrate that the model of doseBadge Reader conformed to the requirements for pattern evaluation described in Annex A of IEC 60942:2003, no general statement or conclusion can be made about conformance of the doseBadge Reader to the requirements of IEC 60942:2003.

Notes:

This certificate provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory. The results within this certificate relate only to the items calibrated. The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%.

JIRANATEE ASSOCIATES CO.,LTD.

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E-mail: jnac-calibration@jiranatee.com
Web site: www.jiranatee.com

Accredited calibration laboratory
ISO/IEC 17025:2017
NSC-TISI-TIS 17025
CALIBRATION 0367

Temperature measurement laboratory
Calibration services department.

NSC – TISI – TIS 17025
CALIBRATION 0367

CERTIFICATE OF CALIBRATION

Certificate No. : CDT-010-67

MEASUREMENT ITEM	: Heat Stress Monitor
MANUFACTURER	: Delta OHM
MODEL/TYPE	: HD32.2
SERIAL NUMBER	: 15006711
ID NUMBER	: RYG_FS0217
CONDITION AS-RECEIVED	: Used item
CUSTOMER	: ALS laboratory group (thailand) Co., Ltd. 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Suan Luang, Khet Suan Luang, Bangkok 10250 Thailand.
RECEIVED DATE	: 05 Jan 2024
MEASUREMENT DATE	: 08 Jan 2024
ISSUE DATE	: 09 Jan 2024

ENVIRONMENTAL CONDITIONS:
Ambient condition in the laboratory are as follow:

Temperature	: 23.0 ± 3.0	°C
Relative Humidity	: 55.0 ± 15.0	%RH

NOTED: *The certificate is valid only to the item calibrated on date and place of calibration.*

TABULATION OF RESULTS:
The table on next page give the measured values.

REVIEW BY Nanakorn P
APPROVED BY
NEXT CAL DATE 7/1/25

Calibration procedure:
The temperature calibration was done by In-House calibration method as WI-CL-001 according to comparison method with standard digital temperature indicator and standard temperature probe. The temperature scale use was based on ITS-90.

Traceability:
The measurement results are traceable to the international system of units (SI) through National Institute of Metrology Thailand (NIMT) Certificate number: TT-0038-23, Certificate number: ER-0101-23

Reference Used During Calibration:
1. Standard Temperature Probe
Model: STS-100 A500, Serial No.: 667682-09
Due date: 28 Mar 2024
2. Digital Temperature Indicator
Model: DTI-1000-A MK II, Serial No.: 671407-00591 Due date: 14 Sep 2024

Uncertainty of Measurement:
The reported uncertainty of measurement is based on the standard uncertainty multiplied by a coverage factor k=2, Which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty has been determined in accordance with the GUM 'Evaluation of measurement data – Guide to the expression of uncertainty in measurement'

Calibrated by:
☐ Mr. Sorawit Thachalad
☐ Miss Jittraporn Lertsomphol
☑ Miss Ruangrumpai Phoommit

Approved signatory: .....
Mr. Parinya Boonchareon
Calibration Department Manager

THIS CERTIFICATE MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

Continuation of Certificate of Calibration Number CDT-010-67

Result of Calibration: ☑ Without Adjustment ☐ With Adjustment

Calibration Range: 20 – 40 °C

Function:

Table 1: This equipment was connected with wet bulb probe Model: HP3201.2 S/N: 16008206.
Dimension: Diameter 3.3 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.059	20.2	0.1	0.099
80	25.051	25.2	0.1	0.099
80	30.047	30.2	0.2	0.099
80	35.039	35.2	0.2	0.099
80	40.035	40.2	0.2	0.099

Table 2: This equipment was connected with Globe thermometer probe Model: TP3276.2.S/N: 17015123.
Dimension: Diameter 3.3 mm. Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.059	20.2	0.1	0.099
110	25.052	25.2	0.1	0.099
110	30.047	30.2	0.2	0.099
110	35.039	35.2	0.2	0.099
110	40.035	40.2	0.2	0.099

Table 3: This equipment was connected with temperature probe Model: TP3207.2 S/N: 17003390.
Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.059	20.2	0.1	0.099
75	25.052	25.1	0.0	0.099
75	30.047	29.9	-0.1	0.099
75	35.040	34.8	-0.2	0.099
75	40.036	39.7	-0.3	0.099

UUC*: Unit Under Calibration

End of Certificate of Calibration

JIRANATEE ASSOCIATES CO.,LTD.

Jiranatee Associates Co.,Ltd
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Accredited calibration laboratory
ISO/IEC 17025:2017
NSC-TISI-TIS 17025
CALIBRATION 0367

Temperature measurement laboratory
Calibration services department.

NSC – TISI – TIS 17025
CALIBRATION 0367

CERTIFICATE OF CALIBRATION

Certificate No. : CDT-054-67

MEASUREMENT ITEM	: Heat Stress Monitor
MANUFACTURER	: Delta OHM
MODEL/TYPE	: HD32.2
SERIAL NUMBER	: 15006713
ID NUMBER	: RYG_FS0218
CONDITION AS-RECEIVED	: Used item
CUSTOMER	: ALS laboratory group (thailand) Co., Ltd. 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Suan Luang, Khet Suan Luang, Bangkok 10250 Thailand.
RECEIVED DATE	: 12 Feb 2024
MEASUREMENT DATE	: 15 Feb 2024
ISSUE DATE	: 20 Feb 2024

ENVIRONMENTAL CONDITIONS:
Ambient condition in the laboratory are as follow:

Temperature	: 23.0 ± 3.0	°C
Relative Humidity	: 55.0 ± 15.0	%RH

NOTED: *The certificate is valid only to the item calibrated on date and place of calibration.*

TABULATION OF RESULTS:
The table on next page give the measured values.

REVIEW BY Nanakorn P
APPROVED BY
NEXT CAL DATE 14/2/25

Calibration procedure:
The temperature calibration was done by In-House calibration method as WI-CL-001 according to comparison method with standard digital temperature indicator and standard temperature probe. The temperature scale use was based on ITS-90.

Traceability:
The measurement results are traceable to the international system of units (SI) through National Institute of Metrology Thailand (NIMT) Certificate number: TT-0038-23, Certificate number: ER-0101-23

Reference Used During Calibration:
1. Standard Temperature Probe
Model: STS-100 A500, Serial No.: 667682-09
Due date: 28 Mar 2024
2. Digital Temperature Indicator
Model: DTI-1000-A MK II, Serial No.: 671407-00591 Due date: 14 Sep 2024

Uncertainty of Measurement:
The reported uncertainty of measurement is based on the standard uncertainty multiplied by a coverage factor k=2, Which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty has been determined in accordance with the GUM 'Evaluation of measurement data – Guide to the expression of uncertainty in measurement'

Calibrated by:
☐ Mr. Sorawit Thachalad
☐ Miss Jittraporn Lertsomphol
☑ Miss Ruangrumpai Phoommit

Approved signatory: .....
Mr. Parinya Boonchareon
Calibration Department Manager

THIS CERTIFICATE MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

Continuation of Certificate of Calibration Number CDT-054-67

Result of Calibration: ☑ Without Adjustment ☐ With Adjustment

Calibration Range: 20 – 40 °C

Function:

Table 1: This equipment was connected with wet bulb probe Model: HP3201.2 S/N: 22035270.
Dimension: Diameter 3.3 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.064	20.1	0.0	0.099
80	25.053	25.1	0.0	0.099
80	30.043	30.1	0.1	0.099
80	35.033	35.1	0.1	0.099
80	40.018	40.1	0.1	0.099

Table 2: This equipment was connected with Globe thermometer probe Model: TP3276.2.S/N: 22035462.
Dimension: Diameter 3.3 mm. Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.064	20.1	0.0	0.099
110	25.053	25.1	0.1	0.16
110	30.043	30.2	0.2	0.099
110	35.033	35.2	0.2	0.099
110	40.018	40.2	0.2	0.099

Table 3: This equipment was connected with temperature probe Model: TP3207.2 S/N: 15015495.
Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.064	20.3	0.2	0.099
75	25.053	25.2	0.1	0.099
75	30.043	30.0	0.0	0.099
75	35.033	35.0	0.0	0.099
75	40.019	39.8	-0.2	0.099

UUC*: Unit Under Calibration
Remark: The reported uncertainty of measurement is 0.16, based on standard uncertainty multiplied by a coverage factor k=2.21 providing a level of confidence of approximately 95%.

End of Certificate of Calibration

Jiranatee Associates Co.,Ltd.

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717-3000-29 FAX. 0-2719-9484

NSC-TISI-TIS17025 CALIBRATION 0008

Cert.No.: 24CH96
Page.: 1 of 3

Certificate of Calibration

Equipment :	pH Meter
Manufacturer :	Mettler Toledo
Model :	SevenCompact S220
Serial No. :	C104059460
ID No. :	RYG_EN0183
Condition As-Received:	Used Item
Received Date :	18 January 2024
Calibration Date :	19 January 2024
Reference :	2401-0579DSC-2
Submitted by :	ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch) 616/10 Moo 5, T.Maenam Khu, A.Pluakdaeng, Rayong 21140, Thailand
Ambient Temperature :	(25 ± 2.5) °C
Relative Humidity :	(50 ± 15) %
Calibration Procedure :	In - house method : - CP-CH5 by direct measurement with standard voltage calibrator and direct measurement with certified reference material (CRM) - CP-CH8 by comparison with themperature standard

REVIEW BY N.Bamyit
APPROVED BY
NEXT CAL. DATE 19/01/25

Calibrated by : Warakorn Lerngagtrakul

Approved by : Saithip
Approved Signatory

(√) Saithip Meangmai
( ) Warakorn Lerngagtrakul
( ) Ponpan Paipim

Issue Date : 24 January 2024

The Uncertainties are for a confidence probability of approximately 95%

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A 0062854

Condition of this calibration result

1. Reference Standard Instrument

Instrument	Serial No.	ID No.	Cert. No.	Due Date
1) Document Process Calibrator	54030049	130RC116	23E2802	27 Aug 2024
2) Ref. Standard Thermometer	4982054	110RC044	23I908	26 July 2024

This certification is traceable to the International System of Unit maintained through:-
- Technology Promotion Association (Thailand-Japan)

2. Certified Reference Materials : The measurement results are traceable to SI through CPA chem Ltd., ANSI-ASQ National Accreditation Board, Accredited No. AR-1835

Buffer Solution	Manufacturer	Lot No.	Exp. date
pH 4.008	CPA chem	940102	27 Nov 2025
pH 6.986	CPA chem	940104	02 Nov 2024
pH 9.997	CPA chem	940106	02 Nov 2024

3. This certificate is valid only to the item calibrated on date and place of calibration.

Calibration Results

Function : mV Measurement

Performing standard curve by Fluke at pH (4,7,10)

Unit Under Calibration	Nominal Value	Standard Voltage Input	Actual Reading		Uncertainty of Measurement	Coverage factor
	pH	mV	mV	pH	(±mV)	*k*
pH Meter	4.000	177.48	177.4	4.000	0.058	2.00
S/N.: C104059460	7.000	0.00	0.0	7.000	0.058	2.00
	10.000	-177.48	-177.5	10.000	0.058	2.00

a 1198287

Calibration Results

Function : pH Measurement

Performing three buffers standard curve by using buffer nominal pH (4.01,7.00,10.01)

Unit Under Calibration	Standard pH Buffer Solution	Actual pH Reading	Actual mV Reading (mV)	Uncertainty of pH Measurement (±)	Coverage factor *k*
pH Electrode	4.008	4.013	176.0	0.0054	2.07
S/N.: 3225367	6.986	6.983	2.2	0.0084	2.00
	9.997	9.996	-174.1	0.0065	2.00

Function : Temperature Measurement

(*) Without adjustment

This equipment was connected with Temperature Probe;
- Model : InLab®Expert Pro-ISM
- Serial No. : 3225367

Dimension of probe
- Length : 120 mm.
- Diameter : 12 mm.
- Immersion Depth : 100 mm.

Calibration Point (°C)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty of measurement (± °C)	Coverage factor *k*
25.0	25.001	25.2	0.199	0.13	2.00

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor *k*, providing a level of confidence of approximately 95 %.

-o0o-

a 1198288

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG, BANGKOK 10250
TEL. 0-2717-3000-24 FAX. 0-2719-9484

NSC-TISI-TIS17025 CALIBRATION 0008

Certificate of Calibration

Certificate No. : 24E289
Page : 1 of 2

Equipment :	pH Meter
Manufacturer:	Mettler Toledo
Model :	SevenCompact S220
Serial No.:	C104059460
ID No.:	RYG_EN0183
Condition As-Received:	Used Item
Received Date:	18 January 2024
Calibration Date:	23 January 2024
Reference:	2401-0579DSC
Ambient Temperature:	(23 ± 2) °C
Relative Humidity:	(50 ± 10) %

This certificate may not be reproduced other than in full, except with the prior written approval of the head of Corporate Services 3: Equipment Calibration and Testing Services.

Submitted by ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
616/10 Moo 5, T.Maenam Khu, A.Pluakdaeng,
Rayong 21140, Thailand

Procedure used: Calibration were conducted using calibration procedure No. CP-E17 According to EURAMET cg-15.

Condition of this result of calibration

1.Reference standards instruments :

Instrument	Model	Serial No.	Certificate No.	Due Date
1) Multi-Product Calibrator	5500A	6315011	E2U2300035	29 May 2024

2.This result of calibration was made on requested at the point specified by customer.

3.The certificate is valid only to the item calibrated on date and place of calibration.

4.This Certification is traceable to the International System of Unit maintained through:-
-NA Caltechnologies Co.,Ltd., ANAB Accredited No. Calibration AC-2658

Calibrated by : Wutchareeporn Wongchutikrane **Approved Signatory :**
Issue Date : 24 January 2024
[ ] Phalinee Prabpaipal
[√] Nuntawat Khamchai
[ ] Pongsagorn Boonyapom

B 0333296

Cert. No.: 24E289
Page.: 2 of 2

Result of calibration :- (*) Without adjustment ( ) After adjustment

Function: DC voltage measurement Range: 2000 mV

Standard Value (mV)	UUC* Reading (mV)	Error (mV)	Uncertainty (± µV)
-200.0000	-200.0	0.0	68
-150.0000	-150.0	0.0	65
-100.0000	-100.0	0.0	63
-50.0000	-50.0	0.0	61
0.0000	0.0	0.0	58
50.0000	50.0	0.0	61
100.0000	99.9	-0.1	63
150.0000	149.9	-0.1	65
200.0000	199.9	-0.1	68

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 %

UUC* = Unit Under Calibration.

-o0o-

a 1198963

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3 : EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717-3000 FAX. 0-2719-9484

Cert.No.: 23TW168
Page.: 1 of 2

Certificate of Testing

Equipment :	DO Meter
Manufacturer :	YSI
Model :	5000-115V
Serial No. :	15E102796
ID No. :	RYG_EN0032
Received Date :	21 July 2023
Test Date :	24 July 2023
Reference :	2307-0713DSC-1
Submitted by :	ALS Laboratory Group (Thailand) Co.,Ltd. Rayong Branch 616/10 Moo 5, T.Maenam Khu, A.Pluakdaeng, Rayong 21140, Thailand
Laboratory Condition :	Temperature (25 ± 5) °C Humidity (50 ± 20) %
Test Procedure :	In - house method : CP-CH9 by Comparison Technique with Azide Modification Method
Tested by :	Walalak Sirithean
Approved by :	Approved Signatory

REVIEW BY N.Bamit
APPROVED BY
NEXT CAL. DATE 24/07/25

( ) Malee Butkruea
(✓) Saithip Meangmai
( ) Warakorn Lerngagtrakul

Issue Date : 26 July 2023

B 0320211

Cert.No.: 23TW168
Page.: 2 of 2

Condition of this result of calibration

1. Reference Standard Instruments :
   This certification is traceable to the International System of Unit through the reference standards laboratory of Industrial Calibration Center,Technology Promotion Association (Thailand-Japan).

Instruments	Serial No.	ID No.	Certificate No.	Due Date
1) Burette	-	130BU10	23CG1172	22 Mar 2025
2) Balance	1126143764	140RC004	22MM50	20 Sep 2023

2. Standard Material :-

Material	Manufacturer	Lot.No.	Assay
Sodium Thiosulfate pentahydrate	Merck	AM1763316	100.2%

Result : **Dissolved Oxygen Meter Adjustment With Air 100 %**

Dissolved Oxygen Probe No.: 15E100464

Titration Method (Azide Modification Method) (mg/L)	DO Meter Reading (mg/L)	Standard Deviation (mg/L)
8.18	8.17	0.0055

This report was certified only for the instrument we tested.It is allowable to use for study the system efficiency,The environmental impact control and present to organization it may concerned intend to use for advertising and referral purpose is prohibited.This report may not be reproduced other in full,without written approval of the laboratory

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a 1172155

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
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ilac-MRA
NSC-TW-TIS1702S
CALIBRATION 0008

Cert. No.: 23LM125
Page.: 1 of 2

Certificate of Calibration

Equipment :	DO Meter with Sensor
Manufacturer :	YSI
Model :	5000-115V
Serial No. :	15E102796
ID No. :	RYG_EN0032
Submitted by :	ALS Laboratory Group (Thailand) Co.,Ltd. Rayong Branch 616/10 Moo 5 T. Maenam Khu, A. Pluakdaeng, Rayong 21140 Thailand
Location :	TPA On Site Calibration Laboratory
Received Order :	25 July 2023
Calibrated Date :	27 July 2023
Ambient Temperature :	(26 ± 10) °C
Relative Humidity :	(50 ± 30) %
AC Line Voltage :	(220 ± 22) V
Calibrated by :	Preecha Hlahib
Approved by :	Approved Signatory

( ) Pornthippa Tameyakul
( ) Malee Butkruea
(✓) Suwit Imjai

Issue Date : 31 July 2023

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full, except with the prior written Approval of the head of Corporate Services 3 : Equipment Calibration and Testing Services.

A 0053616

Equipment : DO Meter with Sensor **Cert. No.:** 23LM125
Condition As-Received : Used Item **Page.:** 2 of 2
Reference : 2307-0713DSC-2

Procedure Used :-

Calibration were conducted using in-house calibration procedure CP-OT01 according to comparison with Industrial Platinum Resistance Thermometer (IPRT) into Temperature Bath.

The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

Instrument	Serial No.	Cert. No.	Traceable	Due Date
1) Digital Thermometer	2188080	22I1285	TPA	21 Oct 2023

2. This certificate is valid only to the item calibrated on date and place of calibration.
3. This certification is traceable to the International System of Unit.

Remark : TPA : Technology Promotion Association (Thailand - Japan)

Result of Calibration :- (*) Without Adjustment

Function : Temperature measurement.

This instrument was connected with temperature sensor, S/N.: 1228475367

Calibration Point (°C)	Immersion Depth (mm)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty (± °C)	Coverage Factor k
20.00	100	20.011	19.91	-0.101	0.15	2.00

UUC* : Unit Under Calibration

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor *k*, providing a level of confidence of approximately 95 %.

-c0o-

a 1159515

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
53/44 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717-3000-29 FAX. 0-2719-9484

NSC-TISI-TIS17025 CALIBRATION 0008

Cert. No.: 23LM962
Page : 1 of 3

Certificate of Calibration

Equipment : Low Temp. Incubator
Manufacturer : Memmert
Model : IPP750
Serial No. : V818.0084
ID No. : RYG_EN0154

REVIEW BY N.Bamrit
APPROVED BY
NEXT CAL. DATE 29/11/24

Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd.
(Rayong Branch)
616/10 Moo 5 T. Maenam Khu,
A. Pluakdaeng, Rayong 21140 Thailand

Location : BOD Room

Received Order : 29 May 2023
Calibration Date : 29 May 2023
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %

Calibrated by : Man Pattanapongpaiboon

Approved by :
Approved Signatory

( ) Pornthippa Tameyakul
( ) Malee Butkruea
(✓) Suwit Imjai

Issue Date : 7 June 2023

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full, except with the prior written Approval of the head of Corporate Services 3 : Equipment Calibration and Testing Services.

A 0054967

Equipment : Low Temp. Incubator **Cert. No.:** 23TM962
Condition As-Received : Used Item **Page :** 2 of 3
Reference : 2305-0898OC-2

Procedure Used :-

Calibration were conducted using calibration procedure CP-OT02 according to direct measurement method with Data Acquisition which connected with Resistance Temperature Detector (RTD).

The temperature scale used was based on ITS-90.

Condition of this result of calibration

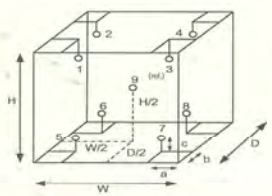
1. Reference standard instrument:-

Instrument	Model	Serial No.	Cert. No.	Due Date
1) Data Acquisition	34972A	MY57013711	22LM93	02 Jul 2023

2. This certificate is valid only to the item calibrated on date and place of calibration.
3. This certification is traceable to the International System of Unit.

Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source
Fresh air setting : Close

Environment during calibration	Beginning	Finished
Temp. (°C)	23	23
REL.Humid. (%)	54	56
AC Supply (Volt)	223	222



Position :	Ref. Std. ID No.:
1	18-18RTD-01
2	18-18RTD-02
3	18-18RTD-03
4	18-18RTD-04
5	18-18RTD-05
6	18-18RTD-10
7	18-18RTD-07
8	22-18RTD-08
9 (ref.)	18-18RTD-09

Probe Installation Details :
a = 10 cm
b = 10 cm
c = 10 cm

Dimension of Chamber :
D = 0.60 m
W = 1.0 m
H = 1.2 m
Capacity = 0.75 m³

a 1165130

Equipment : Low Temp. Incubator **Cert. No.:** 23TM962
Condition As-Received : Used Item **Page :** 3 of 3
Reference : 2305-0898OC-2
Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source
Fresh air setting : Close

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (°C)	Overall Variation (°C)	Coverage Factor k
20.0	20.0	20.0	0.019	0.72	1.0	2

Calibration Point	Measured Temperature (°C) Position									Uncertainty
(°C)	1	2	3	4	5	6	7	8	9 (ref.)	(± °C)
20.0	19.547	19.780	19.487	19.529	19.408	20.139	20.112	20.406	20.116	0.30

Average* : The average of 30 values in each position.
Temperature stability : One-half of the greatest maximum difference of measured temperature at any one sensor.
Temperature uniformity : The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.
Overall Variation : The Difference of the maximum and minimum measured temperatures throughout observation.
UUC* : Unit Under Calibration
Note : The reported uncertainty of measurement was incluced stability and excluded uniformity ,

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor *k*, providing a level of confidence of approximately 95 %.

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a 1165129

Sartorius (Thailand) Co., Ltd.
129 Rama 9 Road, Huaykwang, Huaykwang, Bangkok 10310
Tel: +66 2643 8361-6 , e-mail: service.thailand@sartorius.com

NSC-TISI-TIS 17025
CALIBRATION 0426

SARTORIUS

Certificate of Calibration

REVIEW BY Tharitak.
APPROVED BY
NEXT CAL. DATE 02/02/2025

Model Number : MSE224S-100-DU
Description : Analytical Balance
Serial Number : 0026207038
ID No. : RYG_EN0002
Manufacturer : Sartorius

Certificate No. : 24BCI0069
Issued Date : Friday, February 23, 2024
Reference No. : 229196
Page No. : 1 0f 2

Customer Name : ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
616/10 Moo 5 T.Maenam Khu, A.Pluak Daeng, Rayong 21140, Thailand.

Calibrated Place : ALS Laboratory Group (Thailand) Co., Ltd.(Balance Room)
616/10 Moo 5 T.Maenam Khu, A.Pluakdaeng, Rayong,21140, Thailand.

Calibrated By : Mr.Chonchai Inthana
Calibration Date : Thursday, February 22, 2024

Calibration Procedure No. : This calibration was conducted by
Using In-house calibration procedure number (WI-003)
Based on UKAS LAB 14 : 2019

Metrological data :
Capacity : 220 g Readability : 0.0001 g

Ambients Conditions:
Temperature : 24.2 °C ± 5.0 °C
Humidity : 57.0 % RH ± 10.0 % RH
Pressure ± –

Reasons for calibration
☐ New Installation ☐ Service / Repaired ☑ Re-calibration/ Maintenance

Equipment Condition: ☑ Good Operate ☐ Fair

Measurement Method UKAS Publication Ref :Lab 14

The measurement uncertainty stated is the expended uncertainty which is obtained from the standard uncertainty multiplied by the coverage factor (k=2) to provide a level of confidence of approximately 95%. It is determined in accordance with the Guide to Expression of Uncertainty in Measurement (GUM). The calibration certificate documents the traceability to National Standards, which realise the unit of measurement according to the International Standard System of Units (SI). Report of Tolerance came form list of Sartorius Metrological Specifications.

Traceability:

Model Number	Description	Traceability	Cetificate No.	Due Date
YCS011-522-00	Sartorius weight set 1mg - 5000g E2,YCS011-522-00	TCS	M2308197S	23-Aug-2025
MHB-382SD	Humidity/Barometer/Temp Lutron MHB-382SD	DKSH	C19231845	23-Aug-2024

This certificate relate and apply this equipment only.
This certificate may not be reproduced other than in full except with the prior written approval of the Verification Operation Division Sartorius (Thailand) Co., Ltd.

Mr.chonchai Inthana(Technical Manager)

STAMP SARTORIUS ISO/IEC 17025:2017

SOP FM 33 03 February 2022

Sartorius (Thailand) Co., Ltd.
129 Rama 9 Road, Huaykwang, Huaykwang, Bangkok 10310
Tel: +66 2643 8361-6 Fax: +66 2643-8367, e-mail: service.thailand@sartorius.com

SARTORIUS

Certificate of Calibration

Model Number : MSE224S-100-DU
Description : Analytical Balance
Serial Number : 0026207038
ID No. : RYG_EN0002
Manufacturer : Sartorius

Certificate No. : 24BCI0069
Issued Date : Friday, February 23, 2024
Reference No. : 229196
Page No. : 2 of 2

Calibration Results : Without Adjustment

Repeatability

The reproducibility is the ability of a weighing instrument to display nearly identical readouts under constant test conditions when the same load within a measurement series is placed repeatedly on the weighing pan in the same manner. The standard deviation is used to express reproducibility quantitatively.

Nominal Value : (Low Load)	20.0000	199.9999
20 g	20.0000	200.0000
Tolerance	20.0001	200.0000
0.0001 g	20.0000	199.9999
	20.0001	200.0000
Nominal Value : (High Load)	19.9999	200.0000
200 g	20.0000	200.0000
Tolerance	20.0000	199.9999
0.0001 g	19.9999	200.0001
	19.9999	200.0000
Standard Deviation	0.00007	0.00006

Eccentricity (Off-center loading error)

The off-center loading error is yielded by the difference between the readout of the load, i.e. 1/3 or 1/4 of maximim capacity, placed in the middle of the weighing pan and between each of four additional measurement points (positions defined according to OIML R76).

Nominal value : 100 g
Tolerance *0.0004* g




	Difference
1	–
2	-0.0001
3	-0.0001
4	0.0000
5	-0.0001
6	-

Linearity

The linearity, also called linearity error. Describes the deviation of the characteristic curve of a weighing instrument from the linear slope.

Tolerance *0.0002* g

Nominal Value (g)	Conventional Mass Value (g)	Displayed Value (g)	Deviation (g)	Uncertainty (g)
0.01	0.0100	0.0100	0.0000	0.00018
0.05	0.0500	0.0500	0.0000	0.00018
0.1	0.1000	0.1000	0.0000	0.00018
0.5	0.5000	0.5000	0.0000	0.00018
1	1.0000	1.0000	0.0000	0.00018
5	5.0000	5.0000	0.0000	0.00018
10	10.0000	10.0000	0.0000	0.00018
20	20.0000	20.0000	0.0000	0.00024
50	50.0000	49.9999	-0.0001	0.00019
100	100.0000	100.0000	0.0000	0.00023
200	200.0000	199.9999	-0.0001	0.00032

End of Report.

SOP FM 33 03 February 2022

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NSC-TISI-TIS17025 CALIBRATION 0108

Certificate of Calibration

Cert. No.: 24TM632
Page : 1 of 3

Equipment : Hot Air Oven
Manufacturer : Memmert
Model : UFE 500
Serial No. : G511.1572
ID No. : RYG_EN0010

REVIEW BY Tharitak.
APPROVED BY
NEXT CAL DATE 21/09/25

Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
616/10 Moo 5 T. Maenam Khu,
A. Pluakdaeng,
Rayong 21140 Thailand

Location : Oven Room

Received Order : 21 March 2024
Calibration Date : 21 March 2024
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %

Calibrated by : Man Pattanapongpaiboon

Approved by :
Approved Signatory

( ) Pornthippa Tameyakul
( ) Unnopphol Harachai
(✓) Suwit Imjai

Issue Date : 22 March 2024

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full, except with the prior written Approval of the head of Corporate Services 3 : Equipment Calibration and Testing Services.

Equipment : Hot Air Oven
Condition As-Received : Used Item
Reference : 2403-0563OC-1

Cert. No.: 24TM632
Page : 2 of 3

Procedure Used :-
Calibration were conducted using calibration procedure CP-OT02 according to direct measurement method with Data Acquisition which connected with Resistance Temperature Detector (RTD) and Thermocouple Type T.
The temperature scale used was based on ITS-90.

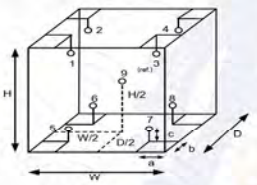
Condition of this result of calibration
1. Reference standard instrument:-

Instrument	Serial No.	Cert. No.	Traceable	Due Date
1) Data Acquisition	MY57013711	23LM115	TPA	11 Jul 2024

2. This certificate is valid only to the item calibrated on date and place of calibration.
3. This certification is traceable to the International System of Unit.
Remark : TPA : Technology Promotion Association (Thailand - Japan)

Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source
Fresh air setting : Close

Environment during calibration	Beginning	Finished
Temp. (°C)	27	27
REL.Humid. (%)	57	59
AC Supply (Volt)	222	224



Probe Installation Details :
a = 5.0 cm
b = 5.0 cm
c = 5.0 cm

Dimension of Chamber :
D = 0.40 m
W = 0.56 m
H = 0.48 m
Capacity = 0.11 m³

Position :	Ref. Std. ID No.: @ Calibration Point (180) °C	(104) °C
1	18-18TC-01	18-18RTD-01
2	18-18TC-02	18-18RTD-02
3	18-18TC-03	18-18RTD-03
4	18-18TC-04	18-18RTD-04
5	18-18TC-05	18-18RTD-05
6	18-18TC-06	23-18RTD-06
7	18-18TC-07	18-18RTD-07
8	18-18TC-08	22-18RTD-08
9 (ref.)	18-18TC-09	18-18RTD-09

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (°C)	Overall Variation (°C)	Coverage Factor *k*
104.0	104.0	104.0	0.051	0.59	0.62	2
180.0	180.0	180.0	0.15	1.3	1.7	2

Calibration Point	Measured Temperature (°C) Position									Uncertainty
(°C)	1	2	3	4	5	6	7	8	9 (ref.)	(±°C)
104.0	103.921	103.786	103.757	103.759	103.950	103.817	104.213	103.672	103.673	0.42
180.0	179.614	179.270	179.145	179.599	180.001	180.423	180.293	180.629	179.429	1.1

Average* : The average of 30 values in each position.
Temperature stability : One-half of the greatest maximum difference of measured temperature at any one sensor.
Temperature uniformity : The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.
Overall Variation : The Difference of the maximum and minimum measured temperatures throughout observation.
UUC* : Unit Under Calibration
Note : The reported uncertainty of measurement was included stability and excluded uniformity .

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor ***k***, providing a level of confidence of approximatey 95 %.

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TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
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ISO/IEC 17025 CALIBRATION 0039

Certificate of Calibration

Cert. No.: 24TM634
Page : 1 of 3

REVIEW BY Thanitak.
APPROVED BY
NEXT CAL DATE 21/03/25

Equipment : Hot Air Oven
Manufacturer : Memmert
Model : UF 110
Serial No. : B423.0853
ID No. : RYG_EN0213

Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
616/10 Moo 5 T. Maenam Khu,
A. Pluakdaeng,
Rayong 21140 Thailand

Location : Oven Room

Received Order : 21 March 2024
Calibration Date : 21 - 22 March 2024
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %

Calibrated by : Man Pattanapongpaiboon

Approved by :
Approved Signatory

( ) Pornthippa Tameyakul
( ) Unnopphol Harachai
(✓) Suwit Imjai

Issue Date : 23 March 2024

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full, except with the prior written Approval of the head of Corporate Services 3 : Equipment Calibration and Testing Services.

Procedure Used :-
Calibration were conducted using calibration procedure CP-OT02 according to direct measurement method with Data Acquisition which connected with Resistance Temperature Detector (RTD) and Thermocouple Type T.
The temperature scale used was based on ITS-90.

Condition of this result of calibration
1. Reference standard instrument:-

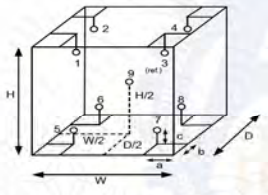
Instrument	Serial No.	Cert. No.	Traceable	Due Date
1) Data Acquisition	MY57013711	23LM115	TPA	11 Jul 2024

2. This certificate is valid only to the item calibrated on date and place of calibration.
3. This certification is traceable to the International System of Unit.

Remark : TPA : Technology Promotion Association (Thailand - Japan)

Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source
Fresh air setting : Close

Environment during calibration	Beginning	Finished
Temp. (°C)	27	27
REL.Humid. (%)	59	59
AC Supply (Volt)	224	223



Position :	Ref. Std. ID No.: @ Calibration Point (180) °C	(104) °C
1	18-18TC-01	18-18RTD-01
2	18-18TC-02	18-18RTD-02
3	18-18TC-03	18-18RTD-03
4	18-18TC-04	18-18RTD-04
5	18-18TC-05	18-18RTD-05
6	18-18TC-06	23-18RTD-06
7	18-18TC-07	18-18RTD-07
8	18-18TC-08	22-18RTD-08
9 (ref.)	18-18TC-09	18-18RTD-09

Probe Installation Details :
a = 5.0 cm
b = 5.0 cm
c = 5.0 cm

Dimension of Chamber :
D = 0.40 m
W = 0.56 m
H = 0.48 m
Capacity = 0.11 m^3

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (°C)	Overall Variation (°C)	Coverage Factor *k*
104.0	104.0	104.0	0.065	0.52	0.90	2
180.0	180.0	180.0	0.20	1.2	2.0	2

Calibration Point	Measured Temperature (°C) Position									Uncertainty
(°C)	1	2	3	4	5	6	7	8	9 (ref.)	(±°C)
104.0	104.169	103.506	103.898	103.712	103.772	103.730	104.289	103.805	103.798	0.42
180.0	180.701	179.239	179.935	179.999	180.127	180.138	180.895	179.313	180.211	1.1

Average* : The average of 30 values in each position.
Temperature stability : One-half of the greatest maximum difference of measured temperature at any one sensor.
Temperature uniformity : The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.
Overall Variation : The Difference of the maximum and minimum measured temperatures throughout observation.
UUC* : Unit Under Calibration
Note : The reported uncertainty of measurement was included stability and excluded uniformity .

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor ***k***, providing a level of confidence of approximately 95 %.

-o0o-

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL.0-2717-3000-29 FAX.0-2719-9484

Certificate of Calibration

Cert. No.: 24TM635
Page : 1 of 3

Equipment :	Water Bath
Manufacturer :	Memmert
Model :	WNB22
Serial No. :	L513.0648
ID No. :	RYG_EN0061

REVIEW BY ThanitaK.
APPROVED BY
NEXT CAL DATE 21/09/25

Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
616/10 Moo 5, T. Maenam Khu,
A. Pluakdaeng,
Rayong 21140, Thailand

Location : Wet Chemistry Lab

Received Order : 21 March 2024
Calibration Date : 21 March 2024
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %

Calibrated by : Man Pattanapongpaiboon

Approved by :
Approved Signatory

( ) Pornthippa Tameyakul
( ) Unnopphol Harachai
(✓) Suwit Imjai

Issue Date : 23 March 2024

The Uncertainties are for a confidence probability of approximately 95%

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Procedure Used :-
Calibration were conducted using in-house calibration procedure CP-OT04 Based on ASTM E715 according to direct measurement method with Data Acquisition which connected with Industrial Platinum Resistance Thermometer (IPRT).
The temperature scale used was based on ITS-90.

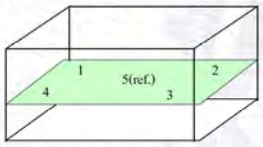
Condition of this result of calibration
1. Reference standard instrument:-

Instrument	Serial No.	Cert. No.	Traceable	Due Date
1) Data Acquisition	MY57013711	23LM-15	TPA	11 Jul 2024

2. This certificate is valid only to the item calibrated on date and place of calibration.
3. This certification is traceable to the International System of Unit.
Remark : TPA : Technology Promotion Association (Thailand - Japan)

Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source
Heat transfer medium used : Water

	Environmental		AC Voltage Supply
	(°C)	(%R.H.)	(Volt)
Beginning of Calibration	25	55	222
Finished of Calibration	25	57	223



Front

Position :	Ref. Std. ID No.:
1	4803988-001
2	4803988-002
3	4803988-003
4	4803988-004
5(ref.)	4803988-005

Calibration point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Average* Standard Reading (°C) Position 1	2	3	4	5 (ref.)	Uncertainty (± °C)
85.0	85.0	85.0	84.428	84.424	84.489	84.507	84.477	0.18

Calibration point (°C)	Uniformity (°C)	Stability (± °C)	Coverage Factor *k*
85.0	0.19	0.11	2

Average* : The average of 30 values in each position.
Uniformity : The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.
Stability : One-half of the greatest maximum difference of measured temperature at any one probe.
UUC* : Unit Under Calibration
Note : The reported uncertainty of measurement was included stability and excluded uniformity.

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor ***k***, providing a level of confidence of approximately 95 %.

-o0o-

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717-3000-29 FAX. 0-2719-9484

Cert.No.: 23CH829
Page.: 1 of 3

Certificate of Calibration

Equipment :	pH Meter
Manufacturer :	Mettler Toledo
Model :	Seven2Go S2
Serial No. :	C222171773
ID No. :	RYG_FS0595
Condition As-Received:	Used Item
Received Date :	30 June 2023
Calibration Date :	03 July 2023
Reference :	2306-0984DSC-5

REVIEW BY Pitthaya Th.
APPROVED BY Suwit S.
NEXT CAL. DATE 03/07/24

Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd. Rayong Branch
616/10 Moo 5, T.Maenam Khu,
A.Pluakdaeng, Rayong 21140, Thailand

Ambient Temperature : (25 ± 2.5) °C
Relative Humidity : (50 ± 15) %
Calibration Procedure : In - house method :
- CP-CH5 by direct measurement with standard voltage calibrator and direct measurement with certified reference material (CRM)
- CP-CH8 by comparison with standard thermometer

Calibrated by : Warakorn Lerngagtrakul

Approved by :
Approved Signatory

(✓) Malee Butkruea
( ) Saithip Meangmai
( ) Warakorn Lerngagtrakul

Issue Date : 6 July 2023

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full, except with the prior written Approval of the head of Corporate Services 3 : Equipment Calibration and Testing Services.

A 0055862

Cert.No.: 23CH829
Page.: 2 of 3

Condition of this calibration result

1. Reference Standard Instrument : -

Instrument	Serial No.	ID No.	Cert. No.	Due Date
1) Document Process Calibrator	54030049	130RC116	22E2769	24 Aug 2023
2) Ref. Standard Thermometer	4982054	110RC044	22I1306	27 Oct 2023

This certification is traceable to the International System of Unit maintained at:-
- Traceable to National Institute of Metrology (Thailand), NIMT

2. Certified Reference Materials : The measurement results are traceable to SI through CPA chem Ltd., ANSI-ASQ National Accreditation Board, Accredited No. AR-1835

Buffer Solution	Manufacturer	Lot No.	Exp. date
pH 4.006	CPA chem	863832	28 Dec 2024
pH 6.986	CPA chem	863833	28 Dec 2023
pH 10.010	CPA chem	863835	28 Dec 2023

3. This certificate is valid only to the item calibrated on date and place of calibration.

Calibration Results

Function : mV Measurement

Performing standard curve by Fluke at pH (4,7,10)

Unit Under Calibration	Nominal Value	Standard Voltage Input	Actual Reading		Uncertainty of Measurement	Coverage factor
	pH	mV	mV	pH	(±mV)	k
pH Meter	4.00	177.48	178	4.00	0.58	2.00
S/N.: C222171773	7.00	0.00	0	7.00	0.58	2.00
	10.00	-177.48	-178	10.00	0.58	2.00

a 1169605

Cert.No.: 23CH829
Page.: 3 of 3

Calibration Results

Function : pH Measurement

Performing three buffers standard curve by using buffer nominal pH (4,7,10)

Unit Under Calibration	Standard pH Buffer Solution	Actual pH Reacing	Actual mV Reading (mV)	Uncertainty of pH measurement (±)	Coverage factor k
pH Electrode	4.008	4.01	178	0.0071	2.00
S/N.: 2103795	6.986	6.99	5	0.0099	2.00
	10.010	10.01	-172	0.0092	2.00

Function : Temperature Measurement

(*) Without adjustment

This equipment was connected with Temperature Probe;
- Model : InLab®Expert Go-ISM
- Serial No. : 2103795

Dimension of probe;
- Length : 120 mm
- Diameter : 12 mm
- Immersion Depth : 100 mm

Calibration Point (°C)	Standard Temperature (°C)	UUC* Reacing (°C)	Error (°C)	Uncertainty of measurement (±°C)	Coverage factor k
25.0	25.002	25.3	0.298	0.13	2.00
30.0	30.002	30.3	0.298	0.13	2.00

Remark : - UUC* = Unit Under Calibration

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor *k*, providing a level of confidence of approximately 95 %.

-o0o-

a 1169604

SCG

Metrological Center

SCI ECO Services Company Limited

33/2 Moo 3, T.Banpa, A.Kaengkhoi, Saraburi 18110, Thailand.
Saraburi Tel : +66 3627 3096 Fax : +66 3627 3100
Bangkok Tel : +668 9205 6851 , +669 8247 2360
Website : www.scieco.co.th E-Mail : calibrate@scg.com

NSC-TISI-TIS 17025 CALIBRATION 0244

Certificate No. T230116 Page 1 of 4

Certificate of Calibration

Equipment	:	Chamber (Cooling Room)
Manufacturer	:	MODULAR
Model	:	IREVCOHCOO
Serial No.	:	C00351459
Customer Code	:	RYG_EN0184
ID No.	:	T1939A5
Customer	:	ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
		616/10 Moo 5 T.Maenam Khu,
		A.Pluakdaeng, Rayong 21140
Customer Location	:	Laboratory
Date of Receipt	:	23 January 2023
Calibrated By	:	Atiphong Rongrat (Technician)
Approved By	:	/ Boonchai Suriyawong (Site Calibration Manager)
Date of Issue	:	07 FEB 2023

REVIEW BY
APPROVED BY
NEXT CAL. DATE 23/07/24

The uncertainties are for a confidence probability of approximately 95%.

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation Scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standard laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the Metrological Center.

FM-L14118/31-08-64

SCG

Metrological Center

SCI ECO Services Company Limited

33/2 Moo 3, T.Banpa, A.Kaengkhoi, Saraburi 18110, Thailand.

NSC-TISI-TIS 17025 CALIBRATION 0244

Certificate No. T230116 Page 2 of 4

Calibration Report

Equipment : Chamber (Cooling Room)
Date of Calibration : 25 January 2023
Environment : Temperature : 23.4-24.9 °C
Line Voltage : 221.4-230.2 V
Relative Humidity : 55 - 65 %RH

Condition of this results of calibration :

1. Thisequipment was calibrated by insert 16 standard thermocouples type T into its chamber , the other one standard thermocouples type T use for ambient temperature measurement . The calibration was done in according to WI-T20 (based on ASTM E145-94 (Reapproved 2001) and AS2853-1986).
All data show below were final values and the initial data from customer request . The temperature scale used was based on ITS - 90 .
2. Reference Standard Instrument :

Instrument	Model	Instrument No.	Certificate No.	Due Date
TC	TYPE T	TN141-TN150	T222123	5 October 2023
TC	TYPE T	TN151-TN160	T222123	5 October 2023
DATA LOGGER	34970A	T150	T222123	5 October 2023

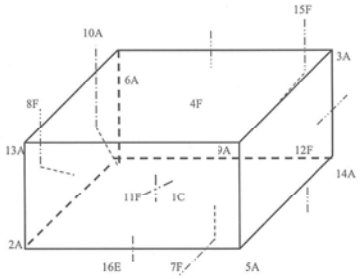
3. This certificate is traceable to :
National Institute of Metrology (Thailand) through Metrological Center (NSC-TISI-TIS 17025 CALIBRATION 0244.)
4. Condition of calibrated item : good
Equipment Description :
Time Constant 1 Hour - Minute At 3 °C
Fresh Air Damper ☐ Open ☐ Min ☐ Medium ☐ Max
☐ Close
☒ Not Available
5. Adjustment :
(X) without adjustment ( ) after adjustment

Approved By

FM-L15 I17/15-05-63

Certificate No. T230116

Calibration Report



C = Centre , F = Centre of Face , A = Corner , E = Centre of Edge

1C	= TN141	12F	= TN152
2A	= TN142	13A	= TN153
3A	= TN143	14A	= TN154
4F	= TN144	15F	= TN155
5A	= TN145	16E	= TN156
6A	= TN146		
7F	= TN147		
8F	= TN148		
9A	= TN149		
10A	= TN150		
11F	= TN151		

Approved By. _____

Certificate No. T230116

Calibration Report

Measurement Results

Calibration Point	Average Standard Reading at each position (°C)											
	TN141	TN142	TN143	TN144	TN145	TN146	TN147	TN148	TN149	TN150	TN151	TN152
3.0	3.03	3.16	3.15	3.19	3.45	3.47	3.21	3.35	3.54	3.45	3.24	3.34
	TN153	TN154	TN155	TN156								
	3.28	3.22	3.28	3.21								

Chamber (Cooling Room)			Temperature Distribution			
Setting (°C)	Reading (°C)		Stability (±°C)	Uniformity (°C)	Uncertainty (±°C)	Coverage Factor k
	Min , Max	Average				
3.0	2.8 , 4.1	3.5	1.20	1.20	1.90	2.07

The calibration result apply only the above calibrated item.
The result of test was found accurate as shown on date and place of test only.
The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor *k* which for a t-distribution, providing a level of confidence of approximately 95 % .

Approved By. _____

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REVIEW BY _____
APPROVED BY _____
NEXT CAL. DATE 13-Jun-25

Agilent CrossLab Compliance Services

Certificate of System Qualification

GC-OQ + GCMS-OQ

System ID:	GM-7
Organization Name:	ALS Laboratory Group (Thailand) Co., Ltd.
Organization Location:	104 Patthanakarn 40, Patthanakarn Rd., Khwang Suan Luang, Khet Suan Luang, Bangkok,
Date:	December 13, 2023 3:32:46 PM
EQP Name:	AgilentRecommended , AgilentRecommended
EQP Revision:	GC.02.50, GCMS.02.50
Overall Qualification Status:	Pass

System Inspection and Basic Safety and Operation

Name: 7890

Setpoint Status: **Pass**

Overall System Inspection and Basic Safety and Operation Test Status

Pass

Inlet Pressure Accuracy

Name: 7890

Front SSL

Setpoint Status: **Pass**

	Setpoint		Actual	
Inlet Pressure:	25.0	psi	25.0	psi

Accuracy: 0.0 psi

Agilent Recommended: <= 1.2

Overall Inlet Pressure Accuracy Test Status

Pass

GC Oven Temperature Accuracy

Name: 7890

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Setpoint Status: **Pass**

Zone: Oven

	Setpoint/Actual		
Temperature:	230.0	232.3	°C
Accuracy:		2.3	°C
Agilent Recommended:	>= -1.0	% setpoint in K	(-5.0 °C)
	<= 1.0	% setpoint in K	(5.0 °C)

Setpoint Status: **Pass**

Zone: Oven

	Setpoint/Actual		
Temperature:	100.0	100.7	°C
Accuracy:		0.7	°C
Agilent Recommended:	>= -1.0	% setpoint in K	(-3.7 °C)
	<= 1.0	% setpoint in K	(3.7 °C)

Overall GC Oven Temperature Accuracy Test Status

Pass

GC Oven Temperature Stability

Name: 7890

Setpoint Status: **Pass**

	Setpoint/Average		
Temperature:	100.0	100.4	°C
Stability:		0.0	°C
Agilent Recommended:	<= 0.5		

Overall GC Oven Temperature Stability Test Status

Pass

Log Amp

Tested Combination1 Front SSL / External SQ

Name: 5977A

Setpoint Status: **Pass**

Overall Log Amp Test Status

Pass

RFPA

Tested Combination1 Front SSL / External SQ

Name: 5977A

Setpoint Status: **Pass**

Amu: 1050 m/z Drift After Five Minutes: 2 mV RFPA Voltage: 504 mV

Agilent Recommended: >= -100 and <= 100 <= 1100

Overall RFPA Test Status

Pass

Tune EI

Tested Combination1 Front SSL / External SQ

Name: 5977A

Setpoint Status: **Pass**

Filament: 1

Setpoint Status: **Pass**

Filament: 2

Overall Tune EI Test Status

Pass

Signal to Noise EI

Tested Combination1 Front SSL / External SQ

Name: 5977A

Source: EI - Extractor Filament: 1

Setpoint Status: **Pass**

Signal to Noise: 11318

Agilent Recommended: >= 1200

Source: EI - Extractor Filament: 2

Setpoint Status: **Pass**

Signal to Noise: 16586

Agilent Recommended: >= 1200

Overall Signal to Noise EI Test Status

Pass

NOTE: This test's 0 comment(s) and 6 deviation(s) are available in the Attachments section.

Instrument Details

Purpose

This section describes the as found system configuration.

Details

System

System ID	GM-7
Manufacturer	Agilent Technologies
Name	7890

Tested Combination1

Injection Technique	Manual Injection
Inlet	Front
Detector	External
LTM Included?	No

Sampler 1

Manufacturer	Agilent Technologies
Type	Manual Injection
Usage	Sample Injection
Syringe Volume (uL)	10

Mainframe 1

Manufacturer	Agilent Technologies
Name	7890
Model Number	G3442B
Serial Number	CN14133181
Firmware Revision	B.02.03
Oven Type	Standard

Inlet 1

Manufacturer	Agilent Technologies
Name	7890
Type	SSL
Location	Front
Carrier Gas	Helium
Control Type	Electronic Pressure Control (EPC)
Purged Inlet	Yes

Detector 1

Manufacturer	Agilent Technologies
Name	Mass Spectrometer
Type	Mass Spectrometer
Location	External

Mass Spectrometer 1

Manufacturer	Agilent Technologies
Type	SQ
Name	5977A
Serial Number	US1416M209
Firmware Revision	5977 6.00.21
High Vacuum System	Turbo Pump
Scouting Run Standard	OFN Std

MS EI Source 1

Manufacturer	Agilent Technologies
Source Type	EI - Extractor
Number of filaments	2

Electronic Signature

Purpose

This signature page was created and published because the ACE sign-off action was executed, which is valid for the entire document, including attachments. The ACE sign-off is an electronic signature that requires two distinct identification components: unique username and personal password. The Agilent representative who has delivered this service understands the meaning and legal status of an electronic signature. As a trained official operator, the Agilent representative has a unique password and logon to access ACE and electronically sign this document. (Other e-signatures can be applied to this document using a Document Content Management or other suitable method defined in your data access and control procedures.)

Details

Full Name of Signer:	Supasak Nimsongtham
Logged On User Name:	supasak.nimsongtham@agilent.com
Signature Creation Date:	December 13, 2023
Reason for Signature:	Executed protocol and published this original version of document

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This document provides a protocol to verify and record instrument configuration and evidence of proper operation. It has been prepared from our interpretation of applicable regulations as well as industry best practices. The document is designed to provide an important component of a complete compliance package. Validation depends upon many factors and use of this protocol alone does not assure compliance. Agilent Technologies makes no promises or representations as to its sufficiency for any specific regulatory program.

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User Name: supasak.nimsongtham
Report Generated by Hostname: ASBKKWX492

System Id: GM-7
Print Date: December 13, 2023 3:32:47 PM

GM-7-2023 Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
December 13, 2023 10:22:24 AM	Audit	SessionCreated	Session	None
December 13, 2023 10:22:24 AM	Start	Configuration	Session	None
December 13, 2023 10:22:24 AM	Audit	Entered	Licensing	User is FieldEngineer, that does not require an unlock code
December 13, 2023 10:23:53 AM	Audit	EqpLoaded	System	EQP details for primary technique [Gc] : File path: [ProtocolFiles/Gc/Configurations/02.50/Gc.02.50.eqp], EQP File Name: [Gc.02.50.eqp], EQP Name: [AgilentRecommended], Protocol Revision: [Gc.02.50] EQP details for hyphenated technique [GcMs] : File path: [ProtocolFiles/GcMs/Configurations/02.50/GcMs.02.50.eqp], EQP File Name: [GcMs.02.50.eqp], EQP Name: [AgilentRecommended]
December 13, 2023 10:23:56 AM	End	Configuration	Session	None
December 13, 2023 10:23:59 AM	Start	Qualification	Session	OQ
December 13, 2023 10:23:59 AM	Start	Execution	System Inspection and Basic Safety and Operation - 7890 - Qualitative Test - No setpoints associated	None

Page 1 / 9

User Name: supasak.nimsongtham
Report Generated by Hostname: ASBKKWX492

System Id: GM-7
Print Date: December 13, 2023 3:32:47 PM

GM-7-2023 Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
December 13, 2023 10:24:10 AM	End	Execution	System Inspection and Basic Safety and Operation - 7890 - Qualitative Test - No setpoints associated	Run Count : 1
December 13, 2023 10:24:11 AM	Start	Execution	Inlet Pressure Accuracy - Front SSL - Pressure Controlled Inlet - S: 25.0 psi - L: <= 1.2 psi	None
December 13, 2023 10:24:15 AM	End	Execution	Inlet Pressure Accuracy - Front SSL - Pressure Controlled Inlet - S: 25.0 psi - L: <= 1.2 psi	Run Count : 1
December 13, 2023 10:24:17 AM	Start	Execution	GC Oven Temperature Accuracy - 7890 - Temperature : Oven - S: 230.0°C - L: >= -1.0 AND <= 1.0 % setpoint in K	None
December 13, 2023 10:32:09 AM	Audit	Data	GC Oven Temperature Accuracy - 7890 - Temperature : Oven - S: 230.0°C - L: >= -1.0 AND <= 1.0 % setpoint in K	Manual Data Entry
December 13, 2023 10:32:11 AM	End	Execution	GC Oven Temperature Accuracy - 7890 - Temperature : Oven - S: 230.0°C - L: >= -1.0 AND <= 1.0 % setpoint in K	Run Count : 1
December 13, 2023 10:32:12 AM	Start	Execution	GC Oven Temperature Accuracy - 7890 - Temperature : Oven - S: 100.0°C - L: >= -1.0 AND <= 1.0 % setpoint in K	None
December 13, 2023 10:34:58 AM	Audit	Data	GC Oven Temperature Accuracy - 7890 - Temperature : Oven - S: 100.0°C - L: >= -1.0 AND <= 1.0 % setpoint in K	Manual Data Entry
December 13, 2023 10:34:59 AM	End	Execution	GC Oven Temperature Accuracy - 7890 - Temperature : Oven - S: 100.0°C - L: >= -1.0 AND <= 1.0 % setpoint in K	Run Count : 1

Page 2 / 9

User Name: supasak.nimsongtham
Report Generated by Hostname: ASBKKWX492

System Id: GM-7
Print Date: December 13, 2023 3:32:47 PM

GM-7-2023 Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
December 13, 2023 10:55:03 AM	Start	Execution	GC Oven Temperature Stability - 7890 - Temperature : Oven - S: 100.0°C - L: <= 0.5°C	None
December 13, 2023 10:55:07 AM	Start	Execution	Signal to Noise EI - Liquid Injection, Front SSL, SQ - Source: EI - Extractor using Filament 1 - L: >= 1200	None
December 13, 2023 10:55:09 AM	Start	Execution	GC Oven Temperature Stability - 7890 - Temperature : Oven - S: 100.0°C - L: <= 0.5°C	None
December 13, 2023 10:55:10 AM	Audit	Data	GC Oven Temperature Stability - 7890 - Temperature : Oven - S: 100.0°C - L: <= 0.5°C	Manual Data Entry
December 13, 2023 10:55:12 AM	End	Execution	GC Oven Temperature Stability - 7890 - Temperature : Oven - S: 100.0°C - L: <= 0.5°C	Run Count : 1
December 13, 2023 10:55:13 AM	Start	Execution	Lvg Amp - 5977A SQ - Source: EI - Extractor	None
December 13, 2023 10:56:42 AM	End	Execution	Lvg Amp - 5977A SQ - Source: EI - Extractor	Run Count : 1
December 13, 2023 10:56:43 AM	Start	Execution	RPPA - 5977A SQ - Source: EI - Extractor	None
December 13, 2023 11:04:44 AM	End	Execution	RPPA - 5977A SQ - Source: EI - Extractor	Run Count : 1
December 13, 2023 11:04:45 AM	Start	Execution	Tune EI - 5977A SQ - Source - EI - Extractor Filament 1 (Qualitative - No setpoints associated)	None
December 13, 2023 11:32:36 AM	End	Execution	Tune EI - 5977A SQ - Source - EI - Extractor Filament 1 (Qualitative - No setpoints associated)	Run Count : 1

Page 3 / 9

User Name: supasak.nimsongtham
Report Generated by Hostname: ASBKKWX492

System Id: GM-7
Print Date: December 13, 2023 3:32:47 PM

GM-7-2023 Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
December 13, 2023 11:32:39 AM	Start	Execution	Tune EI - 5977A SQ - Source - EI - Extractor Filament 2 (Qualitative - No setpoints associated)	None
December 13, 2023 11:33:06 AM	Start	Execution	Signal to Noise EI - Liquid Injection, Front SSL, SQ - Source: EI - Extractor using Filament 1 - L >= 1200	None
December 13, 2023 11:49:39 AM	Start	Execution	Tune EI - 5977A SQ - Source - EI - Extractor Filament 2 (Qualitative - No setpoints associated)	None
December 13, 2023 11:49:42 AM	End	Execution	Tune EI - 5977A SQ - Source - EI - Extractor Filament 2 (Qualitative - No setpoints associated)	Run Count : 1
December 13, 2023 11:49:43 AM	Start	Execution	Signal to Noise EI - Liquid Injection, Front SSL, SQ - Source: EI - Extractor using Filament 1 - L >= 1200	None
December 13, 2023 11:49:46 AM	Audit	acquisition	Session	None
December 13, 2023 12:36:39 PM	Audit	AcquiRestarted	Session	None
December 13, 2023 12:36:40 PM	Audit	SessionReloaded	Session	None
December 13, 2023 12:36:42 PM	Start	Qualification	Session	OQ
December 13, 2023 12:36:42 PM	Start	Execution	Signal to Noise EI - Liquid Injection, Front SSL, SQ - Source: EI - Extractor using Filament 1 - L >= 1200	None

User Name: supasak.nimsongtham
Report Generated by Hostname: ASBKKWX492

System Id: GM-7
Print Date: December 13, 2023 3:32:47 PM

GM-7-2023 Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
December 13, 2023 12:27:32 PM	Audit	Data	Signal to Noise EI - Liquid Injection, Front SSL, SQ - Source: EI - Extractor using Filament 1 - L >= 1200	Data files Path : D:\MassHunter\GCMS\1data\OQ2023\S2N_F1.D
December 13, 2023 12:28:18 PM	End	Execution	Signal to Noise EI - Liquid Injection, Front SSL, SQ - Source: EI - Extractor using Filament 1 - L >= 1200	Run Count : 1
December 13, 2023 12:39:51 PM	Audit	TestUnlocked	Signal to Noise EI - Liquid Injection, Front SSL, SQ - Source: EI - Extractor using Filament 1 - L >= 1200	Deviation filed for Run Count : 1
December 13, 2023 12:39:51 PM	Start	Execution	Signal to Noise EI - Liquid Injection, Front SSL, SQ - Source: EI - Extractor using Filament 1 - L >= 1200	None
December 13, 2023 12:40:15 PM	Audit	Data	Signal to Noise EI - Liquid Injection, Front SSL, SQ - Source: EI - Extractor using Filament 1 - L >= 1200	Data files Path : D:\MassHunter\GCMS\1data\OQ2023\S2N_F1.D
December 13, 2023 12:42:00 PM	End	Execution	Signal to Noise EI - Liquid Injection, Front SSL, SQ - Source: EI - Extractor using Filament 1 - L >= 1200	Run Count : 2
December 13, 2023 12:44:06 PM	Start	Execution	Signal to Noise EI - Liquid Injection, Front SSL, SQ - Source: EI - Extractor using Filament 2 - L >= 1200	None
December 13, 2023 12:49:47 PM	Audit	Data	Signal to Noise EI - Liquid Injection, Front SSL, SQ - Source: EI - Extractor using Filament 2 - L >= 1200	Data files Path : D:\MassHunter\GCMS\1data\OQ2023\S2N_F2.D

User Name: supasak.nimsongtham
Report Generated by Hostname: ASBKKWX492

System Id: GM-7
Print Date: December 13, 2023 3:32:47 PM

GM-7-2023 Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
December 13, 2023 12:43:54 PM	End	Execution	Signal to Noise EI - Liquid Injection, Front SSL, SQ - Source: EI - Extractor using Filament 2 - L >= 1200	Run Count : 1
December 13, 2023 1:54:41 PM	Audit	TestUnlocked	Signal to Noise EI - Liquid Injection, Front SSL, SQ - Source: EI - Extractor using Filament 1 - L >= 1200	Deviation filed for Run Count : 2
December 13, 2023 1:54:41 PM	Start	Execution	Signal to Noise EI - Liquid Injection, Front SSL, SQ - Source: EI - Extractor using Filament 1 - L >= 1200	None
December 13, 2023 1:54:50 PM	Audit	Data	Signal to Noise EI - Liquid Injection, Front SSL, SQ - Source: EI - Extractor using Filament 1 - L >= 1200	Data files Path : D:\MassHunter\GCMS\1data\OQ2023\S2N_F1.D
December 13, 2023 1:55:22 PM	End	Execution	Signal to Noise EI - Liquid Injection, Front SSL, SQ - Source: EI - Extractor using Filament 1 - L >= 1200	Run Count : 3
December 13, 2023 1:56:50 PM	Audit	TestUnlocked	Signal to Noise EI - Liquid Injection, Front SSL, SQ - Source: EI - Extractor using Filament 1 - L >= 1200	Deviation filed for Run Count : 3
December 13, 2023 1:58:10 PM	Start	Execution	Signal to Noise EI - Liquid Injection, Front SSL, SQ - Source: EI - Extractor using Filament 1 - L >= 1200	None
December 13, 2023 2:14:32 PM	Audit	Data	Signal to Noise EI - Liquid Injection, Front SSL, SQ - Source: EI - Extractor using Filament 1 - L >= 1200	Data files Path : D:\MassHunter\GCMS\1data\OQ2023\S2N_F1.D

User Name: supasak.nimsongtham
Report Generated by Hostname: ASBKKWX492

System Id: GM-7
Print Date: December 13, 2023 3:32:47 PM

GM-7-2023 Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
December 13, 2023 2:15:45 PM	End	Execution	Signal to Noise EI - Liquid Injection, Front SSL, SQ - Source: EI - Extractor using Filament 1 - L >= 1200	Run Count : 4
December 13, 2023 2:25:07 PM	Audit	TestUnlocked	Signal to Noise EI - Liquid Injection, Front SSL, SQ - Source: EI - Extractor using Filament 2 - L >= 1200	Deviation filed for Run Count : 1
December 13, 2023 2:25:47 PM	Start	Execution	Signal to Noise EI - Liquid Injection, Front SSL, SQ - Source: EI - Extractor using Filament 2 - L >= 1200	None
December 13, 2023 2:25:50 PM	Audit	Data	Signal to Noise EI - Liquid Injection, Front SSL, SQ - Source: EI - Extractor using Filament 2 - L >= 1200	Data files Path : D:\MassHunter\GCMS\1data\OQ2023\S2N_F2.D
December 13, 2023 2:25:41 PM	End	Execution	Signal to Noise EI - Liquid Injection, Front SSL, SQ - Source: EI - Extractor using Filament 2 - L >= 1200	Run Count : 2
December 13, 2023 2:26:51 PM	Audit	TestUnlocked	Signal to Noise EI - Liquid Injection, Front SSL, SQ - Source: EI - Extractor using Filament 2 - L >= 1200	Deviation filed for Run Count : 2
December 13, 2023 2:26:51 PM	Start	Execution	Signal to Noise EI - Liquid Injection, Front SSL, SQ - Source: EI - Extractor using Filament 2 - L >= 1200	None
December 13, 2023 2:27:01 PM	Audit	Data	Signal to Noise EI - Liquid Injection, Front SSL, SQ - Source: EI - Extractor using Filament 2 - L >= 1200	Data files Path : D:\MassHunter\GCMS\1data\OQ2023\S2N_F2.D

User Name: supasak.nimsongthon System Id: GM-7
Report Generated by Hostname: ASBKKWX492 Print Date: December 13, 2023 3:32:47 PM

GM-7-2023 Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
December 13, 2023 2:27:42 PM	End	Execution	Signal to Noise EI - Liquid Injection, Front SSL, SQ: - Source: EI - Extractor using Filament 2 - L >= 1200	Run Count : 3
December 13, 2023 2:29:14 PM	Audit	TestAborted	Signal to Noise EI - Liquid Injection, Front SSL, SQ: - Source: EI - Extractor using Filament 2 - L >= 1200	Deviation filed for Run Count : 3
December 13, 2023 2:29:14 PM	Start	Execution	Signal to Noise EI - Liquid Injection, Front SSL, SQ: - Source: EI - Extractor using Filament 2 - L >= 1200	None
December 13, 2023 2:34:02 PM	Start	Execution	Signal to Noise EI - Liquid Injection, Front SSL, SQ: - Source: EI - Extractor using Filament 2 - L >= 1200	None
December 13, 2023 2:41:26 PM	Start	Execution	Signal to Noise EI - Liquid Injection, Front SSL, SQ: - Source: EI - Extractor using Filament 2 - L >= 1200	None
December 13, 2023 2:42:42 PM	Audit	Data	Signal to Noise EI - Liquid Injection, Front SSL, SQ: - Source: EI - Extractor using Filament 2 - L >= 1200	Data files Path : D:\MassHunter\GCMS\Data\OQ2023\02N_P2_001.D
December 13, 2023 2:44:33 PM	End	Execution	Signal to Noise EI - Liquid Injection, Front SSL, SQ: - Source: EI - Extractor using Filament 2 - L >= 1200	Run Count : 4
December 13, 2023 2:44:56 PM	End	Qualification	Session	OQ
December 13, 2023 2:44:56 PM	Start	Reporting	Session	None

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User Name: supasak.nimsongthon System Id: GM-7
Report Generated by Hostname: ASBKKWX492 Print Date: December 13, 2023 3:32:47 PM

GM-7-2023 Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
December 13, 2023 3:01:22 PM	Audit	AceClosed	Session	None
December 13, 2023 2:29:16 PM	Audit	AceRestarted	Session	None
December 13, 2023 2:29:16 PM	Audit	SessionReloaded	Session	None
December 13, 2023 3:29:13 PM	Start	Qualification	Session	OQ
December 13, 2023 3:31:33 PM	Audit	Reporting	Session	Report Generated : Certificate
December 13, 2023 3:32:15 PM	Audit	Reporting	Session	Report Generated : Report

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ภาคผนวก จ

สำเนาหนังสืออนุญาตขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

ที่ อก ๐๓๑๐(๑)/ ๑๖๑๖๘ กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๒๐ พฤศจิกายน ๒๕๖๖

เรื่อง ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เอเอลเอล แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน ลงวันที่ ๕ สิงหาคม ๒๕๖๖

สิ่งที่ส่งมาด้วย ๑. รายชื่อผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๑ แผ่น
๒. รายชื่อเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๕ แผ่น
๓. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๑ แผ่น

ตามหนังสือที่อ้างถึง บริษัท เอเอลเอล แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ขอต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ว-๒๐๔ สถานที่ตั้งเลขที่ ๑๐๔ ซอยพัฒนาการ ๔๐ ถนนพัฒนาการ แขวงพัฒนาการ เขตสวนหลวง กรุงเทพมหานคร ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอเอลเอล แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๖ ราย ตามสิ่งที่ส่งมาด้วย ๑
ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ ๑๘๑ ราย ตามสิ่งที่ส่งมาด้วย ๒
ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย น้ำใต้ดิน อากาศเสีย สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว และดิน ตามสิ่งที่ส่งมาด้วย ๓

หนังสือฉบับนี้จะหมดอายุในวันที่ ๒ กันยายน ๒๕๖๙ หากประสงค์จะต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อกรมโรงงานอุตสาหกรรม ภายใน ๓๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ทั้งนี้ สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์ได้ที่หน้าเว็บไซต์กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายสิระ จันทร์เจิด)
นักวิทยาศาสตร์เชี่ยวชาญ รักษาราชการแทน
ผู้อำนวยการกองวิจัยและเฝ้าระวังมลพิษโรงงาน
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเฝ้าระวังมลพิษโรงงาน
กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ
โทร. ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕
โทรสาร ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๙
ไปรษณีย์อิเล็กทรอนิกส์ saraban@diw.mail.go.th

"อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"

สิ่งที่ส่งมาด้วย ๑

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท เอเอลเอล แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ว-๒๐๔
ที่ อก ๐๓๑๐(๑)/ ๑๖๑๖๘ ลงวันที่ ๒๐ พฤศจิกายน ๒๕๖๖

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๖ ราย

๑) นางสาวยุพาพร จันทร์เปล่ง	ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๑
๒) นางสาวชิชนัย ไกมารกุล ณ นคร	ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๒
๓) นายศรายุทธ จิตรานนท์	ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๓
๔) นางสาวกนกกร เอนก	ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๔
๕) นายสุรีรา สอนแก้ว	ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๕
๖) นายวิชาญ ขุณหรัด	ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๖

สิ่งที่ส่งมาด้วย ๒

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท เอเอลเอล แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ว-๒๐๔
ที่ อก ๐๓๑๐(๑)/ ๑๖๑๖๘ ลงวันที่ ๒๐ พฤศจิกายน ๒๕๖๖

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๑๘๑ ราย

๑) นายกาจบัณฑิต กิตติศุภวณิชย์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๑
๒) นายภัทรพล สว่างใจธรรม์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๒
๓) นายนราธิป เพ็ชรขัยคำ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๓
๔) นายศิริโชค พงษ์ประสม	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๔
๕) นายณัฐวุฒิ ด้วงแพง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๕
๖) นางสาวจินตา ไชยุลธรรม	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๖
๗) นางสาวสาวิตรี น้อยเสี้ยม	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๗
๘) นางสาวชณัฐกาญจน์ อิ่มชม	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๘
๙) นางสาวนรินทร์ สายเสิง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๙
๑๐) นางสาวนันทวดี สมบูรณ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๐
๑๑) นางสาวศรัณยา เฉลิมอำรงค์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๑
๑๒) นางสาวชัญญธร มงคลจิรวุฒิ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๒
๑๓) นางสาวศิริลักษณ์ บุนนาค	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๓
๑๔) นายนพพงศ์ จันทรุพันธุ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๔
๑๕) นายนรเศรษฐ์ ไกมาลย์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๕
๑๖) นายอับวา จริยา	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๖
๑๗) นางสาวเกศรินทร์ แก้วมั่น	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๗
๑๘) นางสาวสุวิมล ชัยเรืองวุฒิ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๘
๑๙) นางสาวสุชาดา ธรรมสาวร	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๙
๒๐) นางสาวเปมิกา ชัยเดชชนกุล	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๐
๒๑) นางสาวศศิกร หมุสวัสดิ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๑
๒๒) นางสาวเสาวลักษณ์ สูนภาอำพร	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๒
๒๓) นายอภิสิทธิ์ สิงหา	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๓
๒๔) นายศักดิ์สิทธิ์ ไพศาลพิสุทธิ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๔
๒๕) ว่าที่ร้อยตรีหญิง พรรณิภา ชำเจริญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๕
๒๖) นางจิลดา คำภูแก้ว	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๖
๒๗) นางสาวอรวรรณ รักยง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๗
๒๘) นางสาวนพรัตน์ แย้มกรานต์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๘
๒๙) นายจุลเดช วารินทร์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๙
๓๐) นางสาวลาษรัตน์ ร้องคำ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๐
๓๑) นายพรมมี ศรีปัดเนตร	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๑
๓๒) นายอุทิศ อุ่นสิม	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๒
๓๓) ว่าที่ร้อยตรี เฉลิมเกียรติ อมรศรีเสริม	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๓
๓๔) นางสาววรินยา สร้างงาม	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๔
๓๕) นายอนุพงศ์ วัดนศรีประเสริฐ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๕

๓๖) นางสาวจุฑารัตน์...

๓๖) นางสาวจุฑารัตน์ โอนสันเทียะ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๖
๓๗) นางสาวจารุวรรณ พิมพ์อภิกฤติยา	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๗
๓๘) นางสาวปรางค์ทิพย์ กิจไพศาลศักดิ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๘
๓๙) นางสาวเดือนใจ ทางกลาง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๙
๔๐) นางสาวจิราพร ศิริเวช	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๐
๔๑) นายวรากร ผูกรักษ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๑
๔๒) นายทนง วิริยะสหกิจ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๒
๔๓) นายธนิต เจนจบ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๓
๔๔) นายคณิศร ชำเพชร	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๔
๔๕) นายภูวิช พรหมสะอาด	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๕
๔๖) นายธนเดช โภคาพิพัฒน์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๖
๔๗) นายชวฤทธิ์ วงษ์จันทร์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๗
๔๘) นายอาทิตย์ ศรีเสน	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๘
๔๙) นายเจษดินทร์ คงศักดิไทย	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๙
๕๐) นายจรัส บุญยิ่ง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๐
๕๑) นายธนาณัติ เอนก	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๑
๕๒) นายอภิวัฒน์ หุมหนู	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๒
๕๓) นางสาวสุภาชวัญ มาก	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๓
๕๔) นางสาวทัตพร ชวาลสมบูรณ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๔
๕๕) นางสาวธิติมา บุญเพ็ง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๕
๕๖) นางสาวภามุมาศ นามวัฒน์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๖
๕๗) นางสาวอุไรรัตน์ ทีงสร้างแป้น	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๗
๕๘) นายธีรวัฒน์ ปวงสุข	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๘
๕๙) นายอิทธิพล ยะโส	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๙
๖๐) นายประพจน์ วรรณชูชัย	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๐
๖๑) นายชยธร พวงทิพย์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๑
๖๒) นางสาวกนกวรรณ จันทบาล	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๒
๖๓) นายสิทธิโชค ธงเงิน	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๓
๖๔) นางศิลาวรรณ ใจบุญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๔
๖๕) นางสาวพรรณธิดา พุ่มคง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๕
๖๖) นายนวภัทร ศรีวิริยะ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๖
๖๗) นายสุวิชา ทองอ่อน	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๗
๖๘) นายวิญญู บุญตะนัย	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๘
๖๙) นายสมบูรณ์ บุตรจันทร์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๙
๗๐) นายวิรัตน์ ไชยนะรา	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๐
๗๑) นายนฤเบศน์ เพิ่มพูน	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๑
๗๒) นายจิรณัฐ ขาวละออ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๒
๗๓) นายอัสรี นามบุรี	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๓
๗๔) นายอัศวเรศ จ่อสาว	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๔

๗๕) นายประเสริฐ...

๗๕) นายประเสริฐ สุระชัน์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๗๕
๗๖) นายนุกูล จันทร์เนียม ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๗๖
๗๗) นายพีรพงษ์ ทองคูณปรีดา ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๗๗
๗๘) นายนฤพล ทองบุช ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๗๘
๗๙) นายอนุวัฒน์ ม่วงแพร ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๗๙
๘๐) นายเจตสราวุฒิ ปัดตะมะ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๘๐
๘๑) นายกฤษณะ สายวรรณ์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๘๑
๘๒) นายพิชัย บุญยงค์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๘๒
๘๓) นายภานุพงศ์ โฮมวงศ์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๘๓
๘๔) นายสามารถ คุ้มปลี ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๘๔
๘๕) นายสัญชัย โกศรีนาม ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๘๕
๘๖) นายณัฐวุฒิ ศรีประเสริฐ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๘๖
๘๗) นายชวัลธัช นาคพนม ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๘๗
๘๘) นายพงศธร ชัยทิพย์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๘๘
๘๙) นายสิทธิโชค ทาสีดา ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๘๙
๙๐) นายธนากร อินสุดา ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๙๐
๙๑) นางสาววรรณิชชา ชาติวันชัย ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๙๑
๙๒) นางสาวพิมพ์ตะวัน มินากูล ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๙๒
๙๓) นางสาวเพชรัตน์ สิงห์สมบุญ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๙๓
๙๔) นางสาวชญานิน พรหมจันทร์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๙๔
๙๕) นายกีรติ ทวีราช ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๙๕
๙๖) นายจักริน หมั่นวิชา ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๙๖
๙๗) นายฉัตรชัย สุขเปีย ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๙๗
๙๘) นายณรนนท์ ตีะทองคำ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๙๘
๙๙) นายคุลยพล สนนอก ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๙๙
๑๐๐) นายทักษ์ดนัย อุบลศรี ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๐๐
๑๐๑) นายธนศวร นามะกุฌณา ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๐๑
๑๐๒) นายธิติพงศ์ บัวแดง ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๐๒
๑๐๓) นายนนทชัย อุปถัมภ์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๐๓
๑๐๔) นายนัฐพล คุณสุทธิ์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๐๔
๑๐๕) นายนันทวัฒน์ สาริน ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๐๕
๑๐๖) นายปิยะนัฐ พลมะศรี ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๐๖
๑๐๗) นายพงศ์สิริ โสมเขียว ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๐๗
๑๐๘) นายพีรพัฒน์ กำคำ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๐๘
๑๐๙) นายภาณุพงศ์ มานิตย์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๐๙
๑๑๐) นายมงคล ผลาทิพย์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๑๐
๑๑๑) นายสิรินนท์ ทองอ้น ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๑๑
๑๑๒) นายอเนชา หันสมัย ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๑๒
๑๑๓) นายอดิศักดิ์ ผมไผ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๑๓

๑๑๔) นายอนันตชัย...

๑๑๔) นายอนันตชัย วีสม ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๑๔
๑๑๕) นายวรวุธ ดีนัก ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๑๕
๑๑๖) นายแสงตะวัน นะตะสัต ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๑๖
๑๑๗) นายยุทธพงศ์ รัตนะ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๑๗
๑๑๘) นายชยัณวุฒิ ไชยอะนิจ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๑๘
๑๑๙) นายวิศรุต ศรีธรรมมา ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๑๙
๑๒๐) นายนนทกร เผือกผ่อง ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๒๐
๑๒๑) นายกำชัย สุทธะ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๒๑
๑๒๒) นางสาวณัฐกรณ์ บุญตะนัย ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๒๒
๑๒๓) นางสาวพัชรินทร์ แสนสร้อย ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๒๓
๑๒๔) นายไพรวัลย์ เปรี่ยมพิมาย ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๒๔
๑๒๕) นางสาวศุภมาศ ทองมาก ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๒๕
๑๒๖) นางสาวลลิตา จิตรสว่าง ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๒๖
๑๒๗) นางสาวชไมพร เสิกภู่เงิย: ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๒๗
๑๒๘) นางสาวกฤติมาพร คำมีแก่น ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๒๘
๑๒๙) นางสาวสกุลรัตน์ ภาคภูมิ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๒๙
๑๓๐) นางสาวไพรินทร์ ศรีรูปิ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๓๐
๑๓๑) นางสาวทิพเนตร ผุยปัญญา ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๓๑
๑๓๒) นางสาวสาธิตา ปานทอง ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๓๒
๑๓๓) นางสาวอริสา ทองนวล ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๓๓
๑๓๔) นางสาวอรยา ค้าคล่อง ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๓๔
๑๓๕) นางสาวชุดาภรณ์ สุนทรสนาน ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๓๕
๑๓๖) นางสาวอัญชลี คำจันทร์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๓๖
๑๓๗) นายบุญฤทธิ์ เอี่ยมเทศ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๓๗
๑๓๘) นางสาวศุภรดา ปั้นมยุรา ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๓๘
๑๓๙) นางสาวพาฤดี คุณนาน ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๓๙
๑๔๐) นางสาวจิราเจต พ่องดา ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๔๐
๑๔๑) นางสาวอารยา มีชัย ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๔๑
๑๔๒) นางสาววิชชุตา นาคผจญ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๔๒
๑๔๓) นางสาวนันทิยา จันทะลุน ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๔๓
๑๔๔) นายกิตติพงศ์ แซ่ลี้ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๔๔
๑๔๕) นายอนุวัติ ภูถวิล ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๔๕
๑๔๖) นายธีรพล แสงทอง ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๔๖
๑๔๗) นายศักดิ์พิพัฒน์ บุญมั่น ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๔๗
๑๔๘) นายธิติวัลค์ เอมอุไร ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๔๘
๑๔๙) นายชัยณรงค์ ศรีบุรินทร์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๔๙
๑๕๐) นางสาวอัจฉราวรรณ สวนสนอง ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๕๐
๑๕๑) นางสาวณัฐฐาพร สิงหา ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๕๑
๑๕๒) นายภีมเรศ แหยมโต ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๕๒

๑๕๓) นางสาวอุบล...

๑๕๓) นางสาวอุบล เศิกศิริ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๕๓
๑๕๔) นางสาวมโนรัตน์ ทองบุตร ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๕๔
๑๕๕) นายภาคภูมิ แทนไทย ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๕๕
๑๕๖) นางสาวสุภาณัฐ เมล์พ่วง ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๕๖
๑๕๗) นางสาวพรทิวา สาตาชนม์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๕๗
๑๕๘) นายเอกวิทย์ วันทะนา ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๕๘
๑๕๙) นายไตรมณฑล ทิพย์วรรณ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๕๙
๑๖๐) นายจิรเมธ ประเสริฐสิริพงศ์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๖๐
๑๖๑) นายจิรายุส เกษมสุข ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๖๑
๑๖๒) นายจีรศักดิ์ ศรีวิชัย ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๖๒
๑๖๓) นายณัฐกฤษฎ์ สะพานแก้ว ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๖๓
๑๖๔) นายบูรณศักดิ์ ปะทิ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๖๔
๑๖๕) นายปัณณวิชญ์ เสมอทรัพย์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๖๕
๑๖๖) นายพิชญพงษ์ ไชย ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๖๖
๑๖๗) นายภัทรพงษ์ มณฑาทอง ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๖๗
๑๖๘) นายวสันต์ ตรีนกุล ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๖๘
๑๖๙) นายภาณุเดช เพชรลุด ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๖๙
๑๗๐) นายอนุกูล วิละแสง ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๗๐
๑๗๑) นายภัทรพงษ์ มีสุข ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๗๑
๑๗๒) นางสาวนุชรี ลีละพืป ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๗๒
๑๗๓) นางสาวสุภาวดี โกศรีนาม ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๗๓
๑๗๔) นางสาวอรณิช เทียนดำ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๗๔
๑๗๕) นางสาวพรเพ็ญ ขอบสอน ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๗๕
๑๗๖) นางสาววันวิสา ขอบพิกุล ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๗๖
๑๗๗) นางสาวอรวรรณ เถาร์ทอง ทะเบียนเลขที่ ว ๒๐๔ ๑ ๐๑๗๗
๑๗๘) นางสาวอัยย์ลิณ เมอร์วิณณ์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๗๘
๑๗๙) นางสาววิสรา คุ่ยครอง ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๗๙
๑๘๐) นายวุฒิกร ศิริวรรณ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๘๐
๑๘๑) นางสาวจารุวรรณ กระจ่างพันธุ์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๘๑

สิ่งที่ส่งมาด้วย ๓

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท เอแอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ว-๒๐๔
ที่ อก ๐๓๑๐(๑)/ ๑๖๑๘ ลงวันที่ ๒๐ พฤศจิกายน ๒๕๖๖

ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๗๔ รายการ

น้ำเสีย จำนวน 60 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldicarb	High-Performance Liquid Chromatographic Method[6]
2	Aldicarb Sulfone	High-Performance Liquid Chromatographic Method[6]
3	Aldicarb Sulfoxide	High-Performance Liquid Chromatographic Method[6]
4	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
5	Arsenic	1) Digestion, Inductively Coupled Plasma Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[5]
6	Barium	1) Digestion, Inductively Coupled Plasma Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[5]
7	α-BHC	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
8	β-BHC	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
9	δ-BHC	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
10	γ-BHC	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
11	Biochemical Oxygen Demand	1) 5-Day BOD Test, Azide Modification Method[4] 2) 5-Day BOD Test, Membrane Electrode Method[4]
12	Carbaryl	High-Performance Liquid Chromatographic Method[6]
13	Carbofuran	High-Performance Liquid Chromatographic Method[6]
14	Cadmium	1) Digestion, Inductively Coupled Plasma Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[5]
15	Chemical Oxygen Demand	1) Closed Reflux, Colorimetric Method[4] 2) Closed Reflux, Titrimetric Method[4]
16	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
17	Chromium	1) Digestion, Inductively Coupled Plasma Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[5]
18	Color	ADMI Weighted-Ordinate Spectrophotometric Method[4]

19 Copper...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
19	Copper	1) Digestion, Inductively Coupled Plasma Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[4]
20	Cyanide	Distillation, Colorimetric Method[4]
21	2,4´-DDD	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
22	4,4´-DDD	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
23	2,4´-DDE	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
24	4,4´-DDE	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
25	2,4´-DDT	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
26	4,4´-DDT	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
27	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
28	Endosulfan Sulfate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
29	Endosulfan I	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
30	Endosulfan II	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
31	Endrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
32	Endrin Aldehyde	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
33	Formaldehyde	Distillation, Colorimetric Method[3]
34	Free Chlorine	1) DPD Ferrous Titrimetric Method[4] 2) DPD Colorimetric Method[4]
35	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
36	Heptachlor Epoxide	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
37	Hexavalent Chromium	Colorimetric Method[4]
38	3-Hydroxycarbofuran	High-Performance Liquid Chromatographic Method[4]
39	Lead	1) Digestion, Inductively Coupled Plasma Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[4]

40 Manganese...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
40	Manganese	1) Digestion, Inductively Coupled Plasma Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[4]
41	Mercury	1) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass spectrometric Method[4]
42	Methiocarb	High-Performance Liquid Chromatographic Method[4]
43	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
44	Methomyl	High-Performance Liquid Chromatographic Method[4]
45	Nickel	1) Digestion, Inductively Coupled Plasma Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[4]
46	Oil & Grease	1) Liquid-Liquid, Partition-Gravimetric Method[4] 2) Soxhlet Extraction Method[4]
47	Oxamyl	High-Performance Liquid Chromatographic Method[4]
48	Propoxur	High-Performance Liquid Chromatographic Method[4]
49	pH	Electrometric Method[4]
50	Phenols	1) Distillation, Chloroform Extraction Method[4] 2) Distillation, Direct Photometric Method[4]
51	Selenium	1) Digestion, Inductively Coupled Plasma Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[4]
52	Sulfide	Iodometric Method[4]
53	Temperature	Laboratory and Field Methods[4]
54	Total Dissolved Solids	Dried at 180 °C[4]
55	Total Kjeldahl Nitrogen	Semi-Micro Kjeldahl Method[4]
56	Total Phosphorous	Digestion, Colorimetric Method[4]
57	Total Suspended Solids	Dried from 103-105 °C[4]
58	Toxaphene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
59	Trivalent Chromium	1) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Colorimetric Method; Calculation[4]
60	Zinc	1) Digestion, Inductively Coupled Plasma Method[4] 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[4]

น้ำใต้ดิน...

น้ำใต้ดิน จำนวน 126 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
2	Acetone	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
3	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
4	Anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
5	Antimony	1) Digestion, Inductively Coupled Plasma Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[4]
6	Arsenic	1) Digestion, Inductively Coupled Plasma Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[4]
7	Atrazine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
8	Barium	1) Digestion, Inductively Coupled Plasma Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[4]
9	Benz(a)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
10	Benzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
11	Benzo(b)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
12	Benzo(k)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
13	Benzoic Acid	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
14	Benzo(a)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
15	Benzo[g,h,i]perylene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
16	Beryllium	1) Digestion, Inductively Coupled Plasma Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[4]
17	Bis(2-chloroethyl)ether	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]

18 Bis(2-ethylhexyl)phthalate...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
18	Bis(2-ethylhexyl)phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
20	Bromoform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
21	Butanol	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
22	Butyl benzyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
23	Cadmium	1) Digestion, Inductively Coupled Plasma Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[4]
24	Carbazole	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
25	Carbon disulfide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
27	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
28	p-Chloroaniline	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
31	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
32	2-Chlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
33	Chromium	1) Digestion, Inductively Coupled Plasma Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[4]
34	Chromium (III)	1) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Colorimetric Method; Calculation[4]
35	Chromium (VI)	Colorimetric Method[4]

36 Chrysene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
36	Chrysene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
37	Cyanide	Distillation, Colorimetric Method[4]
38	2,4-D	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
39	DDD	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
40	DDE	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
41	DDT	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
42	Dibenz(a,h)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
43	Di-n-Butyl Phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
44	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
47	3,3-Dichlorobenzidine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
48	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
49	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
50	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
53	2,4-Dichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]

56 1,3-Dichloropropene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
57	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
58	Diethyl Phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
59	2,4-Dimethylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
60	2,4-Dinitrophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
61	2,4-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
62	2,6-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
63	Di-n-octyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
64	Endosulfan	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
65	Endrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
66	Ethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
67	Fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
68	Fluorene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
69	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
70	Heptachlor epoxide	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
71	Hexachlorobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
73	n-Hexane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
74	α-HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
75	β-HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]

76 γ-HCH...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
76	γ-HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
77	Hexachlorocyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
78	Hexachloroethane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
79	Indeno(1,2,3-cd)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
80	Isophorone	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
81	Lead	1) Digestion, Inductively Coupled Plasma Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[4]
82	Manganese	1) Digestion, Inductively Coupled Plasma Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[4]
83	Mercury	1) Digestion, Cold Vapor Atomic Absorption Spectrometric Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[4]
84	Methanol	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
85	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
86	Methyl bromide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
87	Methylene chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
88	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
89	2-Methylnapthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
90	Methyl tert-butyl Ether	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
91	Naphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
92	Nickel	1) Digestion, Inductively Coupled Plasma Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[4]
93	Nitrobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]

94 N-Nitrosodiphenylamine...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
94	N-Nitrosodiphenylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
95	N-Nitrosodi-n-Propylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
96	Polychlorinated Biphenyls - PCB 1016 - PCB 1221 - PCB 1232 - PCB 1242 - PCB 1248 - PCB 1254 - PCB 1260	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
97	Pentachlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
98	pH	Electrometric Method[4]
99	Phenanthrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
100	Phenol	1) Distillation, Chloroform Extraction Method[4] 2) Distillation, Direct Photometric Method[4] 3) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
101	Pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
102	Selenium	1) Digestion, Inductively Coupled Plasma Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[4]
103	Silver	1) Digestion, Inductively Coupled Plasma Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[4]
104	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
105	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
106	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
107	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
108	Toxaphene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
109	TPH (C_5-C_8)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[14,25]

110 TPH ($C_{>8}$-C_{16})...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
110	TPH ($C_{>8}$-C_{16})	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[9,22]
111	TPH ($C_{>16}$-C_{35})	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[9,22]
112	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
113	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
114	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
115	Trichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
116	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
117	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
118	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
119	Vanadium	1) Digestion, Inductively Coupled Plasma Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[4]
120	Vinyl acetate	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
121	Vinyl chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
122	m-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
123	o-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
124	p-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
125	Xylene (Total)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
126	Zinc	1) Digestion, Inductively Coupled Plasma Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[4]

อากาศเสีย...

อากาศเสีย (ปล่องระบาย) จำนวน 28 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Antimony	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[5]
2	Arsenic	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[5]
3	Beryllium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[5]
4	Cadmium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[5]
5	Carbon Monoxide	1) Instrumental Analyzer Method[5] 2) Sampling Bag Non-Dispersive Infrared Method[5]
6	Chlorine	1) Absorption Sampling, Ion Chromatographic Method[5] 2) Isokinetic Sampling, Ion Chromatographic Method [5]
7	Chromium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[5]
8	Cobalt	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[5]
9	Copper	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[5]
10	Cresol	Adsorption Sampling, Gas Chromatographic Method[5]
11	Dioxins	Isokinetic Sampling[5]
12	Hydrogen Chloride	1) Absorption Sampling, Ion Chromatographic Method[5] 2) Isokinetic Sampling, Ion Chromatographic Method[5]
13	Hydrogen Fluoride	1) Absorption Sampling, Ion Chromatographic Method[5] 2) Isokinetic Sampling, Ion Chromatographic Method[5]
14	Hydrogen Sulfide	Absorption Sampling, Iodometric Method[5]

15 Lead...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
15	Lead	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[5]
16	Manganese	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[5]
17	Mercury	1) Isokinetic Sampling, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method[5] 2) Isokinetic Sampling, Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method[5]
18	Nickel	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[5]
19	Opacity	Ringelmann's Method[2]
20	Oxides of Nitrogen	1) Absorption Sampling, Phenoldisulfonic Acid Method[5] 2) Absorption Sampling, Alkaline Permanganate/ Colorimetric Method[5] 3) Instrumental Analyzer Method[5]
21	Selenium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[5]
22	Sulfur Dioxide	1) Absorption Sampling, Barium-Thorin Titrimetric Method[5] 2) Instrumental Analyzer Method[5]
23	Sulfuric Acid	Isokinetic Sampling, Barium-Thorin Titrimetric Method[5]
24	Tellurium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[5]
25	Tin	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[5]
26	Total Suspended Particulate	1) Isokinetic Sampling, Gravimetric Method[5] 2) Paired Train, Isokinetic Sampling, Gravimetric Method[5]

27 Vanadium...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
27	Vanadium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[5]
28	Xylene	Adsorption Sampling, Gas Chromatographic Method[5]

สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว จำนวน 35 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[1,9,26] 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
2	Antimony	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[1,6,17] 3) Digestion, Inductively Coupled Plasma Method[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
3	Arsenic	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[1,6,17] 3) Digestion, Inductively Coupled Plasma Method[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
4	Barium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[1,6,17] 3) Digestion, Inductively Coupled Plasma Method[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]

5 Beryllium...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
5	Beryllium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[1,6,17] 3) Digestion, Inductively Coupled Plasma Method[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
6	Cadmium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[1,6,17] 3) Digestion, Inductively Coupled Plasma Method[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
7	Chlordane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[1,9,26] 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
8	Chromium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[1,6,17] 3) Digestion, Inductively Coupled Plasma Method[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
9	Chromium (III)	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method; Waste Extraction, Colorimetric Method; Calculation Method[1,6,16,19] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Waste Extraction, Colorimetric Method; Calculation Method[1,6,17,19] 3) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method[7,8,16,19] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method[7,8, 17,19]

10 Chromium (VI)...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
10	Chromium (VI)	1) Waste Extraction, Colorimetric Method[1,6,19] 2) Alkaline Digestion, Colorimetric Method[8,19]
11	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[1,6,17] 3) Digestion, Inductively Coupled Plasma Method[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
12	Copper	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[1,6,17] 3) Digestion, Inductively Coupled Plasma Method[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
13	2,4-D	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[1,9,26] 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
14	DDD	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[1,9,26] 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
15	DDE	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[1,9,26] 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
16	DDT	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[1,9,26]

2) Soxhlet...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
		2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
17	Dieldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[1,9,26] 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
18	Endrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[1,9,26] 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
19	Heptachlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[1,9,26] 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
20	Lead	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[1,6,17] 3) Digestion, Inductively Coupled Plasma Method[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
21	Lindane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[1,9,26] 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]

22 Mercury...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
22	Mercury	1) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method[1,6,20] 2) Waste Extraction, Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method[1,6,30] 3) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method[20] 4) Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method[30] 5) Thermal Decomposition Amalgamation and Atomic Absorption Spectrometric Method[21]
23	Methoxychlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[1,9,26] 2) Soxhlet Extraction, Gas Chromatographic / Mass Spectrometric Method[10,26] 3) Automated Soxhlet Extraction, Gas Chromatographic /Mass Spectrometric Method[11,26]
24	Mirex	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[1,9,26] 2) Soxhlet Extraction, Gas Chromatographic / Mass Spectrometric Method[10,26] 3) Automated Soxhlet Extraction, Gas Chromatographic /Mass Spectrometric Method[11,26]
25	Molybdenum	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[1,6,17] 3) Digestion, Inductively Coupled Plasma Method[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
26	Nickel	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[1,6,17] 3) Digestion, Inductively Coupled Plasma Method[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
27	Polychlorinated biphenyls (PCBs) - Aroclor 1016 - Aroclor 1221 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[1,9,26] 2) Soxhlet Extraction, Gas Chromatographic Method[10,26] 3) Automated Soxhlet Extraction, Gas Chromatographic Method[11,26]

- 2-Chlorobiphenyl...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
	- 2-Chlorobiphenyl - 2,3-Dichlorobiphenyl - 2,2',5-Trichlorobiphenyl - 2,4',5-Trichlorobiphenyl - 2,2',3,5'-Tetrachlorobipheny. - 2,2',5,5'-Tetrachlorobipheny. - 2,3',4,4'-Tetrachlorobipheny. - 2,2',3,4,5'-Pentachlorobiphenyl - 2,2',4,5,5'-Pentachlorobiphenyl - 2,3,3',4',6-Pentachlorobiphenyl - 2,2',3,4,4',5'-Hexachlorobiphenyl - 2,2',3,4,5,5'-Hexachlorobiphenyl - 2,2',3,5,5',6-Hexachlorobiphenyl - 2,2',4,4',5,5'-Hexachlorobiphenyl - 2,2',3,3',4,4',5-Heptachlorobiphenyl - 2,2',3,4,4',5,5'-Heptachlorobiphenyl - 2,2',3,4,4',5',6-Heptachlorobiphenyl - 2,2',3,4',5,5',6-Heptachlorobiphenyl - 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	
28	Pentachlorophenol	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[1,9,26] 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
29	pH	Electrometric Method[23,26]
30	Selenium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[1,6,17] 3) Digestion, Inductively Coupled Plasma Method[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]

31 Silver...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
31	Silver	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[1,6,17] 3) Digestion, Inductively Coupled Plasma Method[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
32	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[1,6,17] 3) Digestion, Inductively Coupled Plasma Method[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
33	Toxaphene	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[1,9,26] 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
34	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[1,6,17] 3) Digestion, Inductively Coupled Plasma Method[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
35	Zinc	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[1,6,17] 3) Digestion, Inductively Coupled Plasma Method[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]

ดิน...

ดิน จำนวน 125 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
2	Acetone	1)Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25] 2) Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method[13]
3	Aldrin	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
4	Anthracene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
5	Antimony	1) Digestion, Inductively Coupled Plasma Method[7,16] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
6	Arsenic	1) Digestion, Inductively Coupled Plasma Method[7,16] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
7	Atrazine	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
8	Barium	1) Digestion, Inductively Coupled Plasma Method[7,16] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
9	Benz(a)anthracene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
10	Benzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]

11 Benzo(b)fluoranthene

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
11	Benzo(b)fluoranthene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
12	Benzo(k)fluoranthene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
13	Benzoic acid	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
14	Benzo(a)pyrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
15	Benzo(g,h,i)perylene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
16	Beryllium	1) Digestion, Inductively Coupled Plasma Method[7,16] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
17	Bis(2-chloroethyl)ether	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
18	Bis(2-ethylhexyl)phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
20	Bromoform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
21	Butanol	Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method[13,25]
22	Butyl Benzyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]

23 Cadmium...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
23	Cadmium	1) Digestion, Inductively Coupled Plasma Method[7,16] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
24	Carbazole	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
25	Carbon Disulfide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
27	Chlordane	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
28	p-Chloroaniline	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
31	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
32	2-Chlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
33	Chromium	1) Digestion, Inductively Coupled Plasma Method[7,16] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
34	Chromium (III)	1) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method: Calculation Method[7,8,16,19] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method[7,8,17,19]
35	Chromium (VI)	Alkaline Digestion, Colorimetric Method[8,19]

36 Chrysene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
36	Chrysene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
37	Cyanide	Extraction, Distillation, Colorimetric Method[27,28,29]
38	2,4-D	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
39	DDD	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
40	DDE	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
41	DDT	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
42	Dibenz(a,h)anthracene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
43	Di-n-Butyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
44	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
47	3,3-Dichlorobenzidine	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
48	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]

49 1,2-Dichloroethane...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
49	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
50	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
53	2,4-Dichlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
57	Dieldrin	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
58	Diethyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
59	2,4-Dimethylphenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
60	2,4-Dinitrophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
61	2,4-Dinitrotoluene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
62	2,6-Dinitrotoluene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]

63 Di-n-Octyl Phthalate...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
63	Di-n-Octyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
64	Endosulfan	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
65	Endrin	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
66	Ethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
67	Fluoranthene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
68	Fluorene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
69	Heptachlor	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
70	Heptachlor epoxide	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
71	Hexachlorobenzene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
73	n-Hexane	1) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25] 2) Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method[13]

73 n-Hexane...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
74	α-HCH	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
75	β-HCH	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
76	γ-HCH	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
77	Hexachlorocyclopentadiene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
78	Hexachloroethane	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
79	Indeno(1,2,3-cd)pyrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
80	Isophorone	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
81	Lead	1) Digestion, Inductively Coupled Plasma Method[7,16] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
82	Manganese	1) Digestion, Inductively Coupled Plasma Method[7,16] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
83	Mercury	1) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method[20] 2) Thermal Decomposition, Amalgamation, and Atomic Absorption Spectrophotometry[21] 3) Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method[30]

84 Methanol...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
84	Methanol	1) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25] 2) Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method[13,25]
85	Methoxychlor	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
86	Methyl Bromide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
87	Methylene Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
88	2-methylphenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
89	2-Methylnaphthalene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
90	Methyl tert-Butyl Ether	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
91	Naphthalene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
92	Nickel	1) Digestion, Inductively Coupled Plasma Method[7,16] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
93	Nitrobenzene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26
94	N-Nitrosodiphenylamine	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
95	N-Nitrosodi-n-propylamine	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[30,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]

96 Polychlorinated biphenyls (PCBs)

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
96	Polychlorinated biphenyls (PCBs) - Aroclor 1016 - Aroclor 1221 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260 - 2-Chlorobiphenyl - 2,2',3,5'-Tetrachlorobipheny. - 2,2',5,5'-Tetrachlorobipheny. - 2,3',4,4'-Tetrachlorobipheny. - 2,2',3,4,5'-Pentachlorobiphenyl - 2,2',4,5,5'-Pentachlorobiphenyl - 2,3,3',4',6-Pentachlorobiphenyl - 2,2',3,4,4',5'-Hexachlorobiphenyl - 2,2',3,4,5,5'-Hexachlorobiphenyl - 2,2',3,5,5',6-Hexachlorobiphenyl - 2,2',4,4',5,5'-Hexachlorobiphenyl - 2,2',3,3',4,4',5-Heptachlorobiphenyl - 2,2',3,4,4',5,5'-Heptachlorobiphenyl - 2,2',3,4,4',5',6-Heptachlorobiphenyl - 2,2',3,4',5,5',6-Heptachlorobiphenyl - 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
97	Pentachlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
98	Phenanthrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]

99 Phenol...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
99	Phenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
100	Pyrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
101	Selenium	1) Digestion, Inductively Coupled Plasma Method[7,16] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
102	Silver	1) Digestion, Inductively Coupled Plasma Method[7,16] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
103	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
104	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
105	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
106	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
107	Toxaphene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[30,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
108	TPH (C_5–C_8)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
109	TPH ($C_{>8}$– C_{16})	1) Automate Extraction, Gas Chromatographic Method[11,22] 2) Solvent Extraction, Gas Chromatographic Method[12,22] 3) Ultrasonic Extraction, Gas Chromatographic Method[22,31]
110	TPH ($C_{>16}$ – C_{35})	1) Automate Extraction, Gas Chromatographic Method[11,22] 2) Solvent Extraction, Gas Chromatographic Method[12,22] 3) Ultrasonic Extraction, Gas Chromatographic Method[22,31]
111	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
112	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
113	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
114	Trichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]

115 2,4,5-Trichlorophenol...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
115	2,4,5-Trichlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
116	2,4,6-Trichlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
117	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
118	Vanadium	1) Digestion, Inductively Coupled Plasma Method[7,16] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
119	Vinyl Acetate	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
120	Vinyl Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
121	m-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
122	o-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
123	p-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
124	Xylene (Total)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
125	Zinc	1) Digestion, Inductively Coupled Plasma Method[7,16] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]

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ที่ อก ๐๓๓๐(๓)/ ๖๔๗๐

กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๒๘ มิถุนายน ๒๕๖๔

เรื่อง ขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และขอบข่ายสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน ลงวันที่ ๒๘ เมษายน ๒๕๖๔

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน บริษัท เอแอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด จำนวน ๒ แผ่น

ตามหนังสือที่อ้างถึง บริษัท เอแอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ขอขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน พร้อมรายชื่อผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ และรายการสารมลพิษที่จะทำการวิเคราะห์ ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอแอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน มีเลขทะเบียน ว-๓๒๓ สถานที่ตั้งเลขที่ ๖๓๖/๓๐ หมู่ที่ ๕ ตำบลแม่น้ำคู้ อำเภอบ่อวิน จังหวัดชลบุรี โดยมีองค์ประกอบดังนี้

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์

๑) นายเดช ช้างขน	ทะเบียนเลขที่	ว-๓๒๓-ก-๐๔๔๖
๒) นางวิลาวัณย์ บริรักษ์	ทะเบียนเลขที่	ว-๓๒๓-ก-๐๔๔๓
๓) นายสุพจน์ สถามเตีย	ทะเบียนเลขที่	ว-๓๒๓-ก-๐๔๔๔

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์

๑) นางสาวนฤมล บรรจงกิจ	ทะเบียนเลขที่	ว-๓๒๓-จ-๐๔๔๕
๒) นางพจนา สีดา	ทะเบียนเลขที่	ว-๓๒๓-จ-๐๔๔๖
๓) นางสาวธนิดา กุลสุริวงศ์	ทะเบียนเลขที่	ว-๓๒๓-จ-๐๔๔๗
๔) นายพิทยา ทองแดง	ทะเบียนเลขที่	ว-๓๒๓-จ-๐๔๔๘
๕) นางชลธิชา สุบงกช	ทะเบียนเลขที่	ว-๓๒๓-จ-๐๔๔๙
๖) ว่าที่ ร.ต.ณชัย ม่วงมา	ทะเบียนเลขที่	ว-๓๒๓-จ-๐๔๔๕๐
๗) นายวราวุฒิ พับพา	ทะเบียนเลขที่	ว-๓๒๓-จ-๐๔๔๕๑
๘) นายศักดินรินทร์ จรัสกาย	ทะเบียนเลขที่	ว-๓๒๓-จ-๐๔๔๕๒
๙) นายสุรศักดิ์ สาชิน	ทะเบียนเลขที่	ว-๓๒๓-จ-๐๔๔๕๓
๑๐) นางสาวเพชรคุณ ภวภูตานนท์	ทะเบียนเลขที่	ว-๓๒๓-จ-๐๔๔๕๔
๑๑) นายสถาพร ถาแก้ว	ทะเบียนเลขที่	ว-๓๒๓-จ-๐๔๔๕๕
๑๒) นายสุทธิ์ดำรงค์ ไชคบิดินันท์	ทะเบียนเลขที่	ว-๓๒๓-จ-๐๔๔๕๖

๑๓) นายวิรัลลภ ...

๑๓) นายวัสลภ หันไชยเนาว์ ทะเบียนเลขที่ ว-๓๒๓-จ-๐๔๕๗
๑๔) นางสาววนาลี เหรียญตระกูล ทะเบียนเลขที่ ว-๓๒๓-จ-๐๔๕๘
๑๕) นางสาววนิดา ผดุงจิตต์ ทะเบียนเลขที่ ว-๓๒๓-จ-๐๔๕๙
๑๖) นายธนะสิทธิ์ วงศ์ษาไชย ทะเบียนเลขที่ ว-๓๒๓-จ-๐๔๖๐
๑๗) นายชัยนุสรณ์ เลิศนันทกุลชัย ทะเบียนเลขที่ ว-๓๒๓-จ-๐๔๖๑
๑๘) นายสัจจา เพ็ชรนสวง ทะเบียนเลขที่ ว-๓๒๓-จ-๐๔๖๒
๑๙) นายกันตภณ มณีสัมพันธ์ ทะเบียนเลขที่ ว-๓๒๓-จ-๐๔๖๓
๒๐) นางสาวจันทนีย์ โกเมนชนะ ทะเบียนเลขที่ ว-๓๒๓-จ-๐๔๖๔
๒๑) นายธารินทร์ อ๊อกจันดา ทะเบียนเลขที่ ว-๓๒๓-จ-๐๔๖๕
๒๒) นายศุภณัฐ พิสัยพันธ์ ทะเบียนเลขที่ ว-๓๒๓-จ-๐๔๖๖
๒๓) นายศุภชัย วงศ์สุรีย์ฉาย ทะเบียนเลขที่ ว-๓๒๓-จ-๐๔๖๗
๒๔) นายปฐมพงศ์ กระวัลดี์ ทะเบียนเลขที่ ว-๓๒๓-จ-๐๔๖๘
๒๕) นายไสว ต้นโพธิ์ ทะเบียนเลขที่ ว-๓๒๓-จ-๐๔๖๙
๒๖) นางสาวกิตติยา สัมญาอริยาภรณ์ ทะเบียนเลขที่ ว-๓๒๓-จ-๐๔๗๐
๒๗) นางสาวเจษฎาพร ศรีบุญเรือง ทะเบียนเลขที่ ว-๓๒๓-จ-๐๔๗๓
๒๘) นางสาวบุศริบทร์ สิงห์เงา ทะเบียนเลขที่ ว-๓๒๓-จ-๐๔๗๒
๒๙) นางสาวธิดารัตน์ ริวิมังคะโร ทะเบียนเลขที่ ว-๓๒๓-จ-๐๔๗๓
๓๐) นายพิพัฒน์ นิภิทร์เศรษฐ์ ทะเบียนเลขที่ ว-๓๒๓-จ-๐๔๗๔
๓๑) นายศิริวิทย์ เรืองสม ทะเบียนเลขที่ ว-๓๒๓-จ-๐๔๗๕
๓๒) นายปาราเมศ สัตยาคุณ ทะเบียนเลขที่ ว-๓๒๓-จ-๐๔๗๖
๓๓) นายนฤนาท ธรรมสะโร ทะเบียนเลขที่ ว-๓๒๓-จ-๐๔๗๗
๓๔) นางสาวศุภวัตน์ ไสจันทร์ ทะเบียนเลขที่ ว-๓๒๓-จ-๐๔๗๘
๓๕) นายพชรกร อินทรเสนา ทะเบียนเลขที่ ว-๓๒๓-จ-๐๔๗๙
๓๖) นายทิวากร เชื้อมาก ทะเบียนเลขที่ ว-๓๒๓-จ-๐๔๘๐
๓๗) นายอนุรักษ์ ทองจรศักดา ทะเบียนเลขที่ ว-๓๒๓-จ-๐๔๘๓
๓๘) นายอภิชาติ วิลาศ ทะเบียนเลขที่ ว-๓๒๓-จ-๐๔๘๒
๓๙) นายจรัสระวี ศรีรักษา ทะเบียนเลขที่ ว-๓๒๓-จ-๐๔๘๓
๔๐) นายประสานมิตร เชื้อนเพชร ทะเบียนเลขที่ ว-๓๒๓-จ-๐๔๘๔
๔๑) นายภานุวัฒน์ วังบง ทะเบียนเลขที่ ว-๓๒๓-จ-๐๔๘๕
๔๒) นายสันติ ชัยชนะ ทะเบียนเลขที่ ว-๓๒๓-จ-๐๔๘๖
๔๓) นายสิทธิชัย แก้วมาตุ ทะเบียนเลขที่ ว-๓๒๓-จ-๐๔๘๗
๔๔) นายทินกร กุลทาดี ทะเบียนเลขที่ ว-๓๒๓-จ-๐๔๘๘

ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย จำนวน ๑๔ รายการ อากาศเสีย (ปล่องระบาย) จำนวน ๗ รายการ และน้ำใต้ดิน จำนวน ๓ รายการ รวมทั้งสิ้นจำนวน ๒๔ รายการ ตามสิ่งที่ส่งมาด้วย

หนังสือฉบับนี้มีอายุ ๓ ปี นับจากวันที่กรมโรงงานอุตสาหกรรมออกหนังสือ หากประสงค์จะต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อกรมโรงงานอุตสาหกรรมภายใน ๓๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ซึ่งคำขอต่ออายุดังกล่าวขอรับได้ที่กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นางจินดา เดชะศรินทร์)
ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

๒๘ มิ.ย. ๒๕๖๔

กองวิจัยและเตือนภัยมลพิษโรงงาน
ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก
โทร. ๐ ๓๘๐๕ ๙๒๖๓-๓
ไปรษณีย์อิเล็กทรอนิกส์ einw@diw.mail.go.th

เอกสารแบบท้ายหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท เอแอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ว-๓๒๓
ที่ อก ๐๓๑๐(๓)/ ๖๔๗๐ ลงวันที่ ๒๘ มิถุนายน ๒๕๖๔

ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๒๔ รายการ

น้ำเสีย จำนวน 14 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Biochemical Oxygen Demand	1) 5-Day BOD Test, Membrane Electrode Method[2] 2) 5-Day BOD Test, Azide Modification Method[2]
2	Chemical Oxygen Demand	1) Open Reflux, Titrimetric Method[2] 2) Closed Reflux, Colorimetric Method[2] 3) Closed Reflux, Titrimetric Method[2]
3	Color	ADMI Weighted – Ordinate Spectrophotometric Method[2]
4	Cyanide	Distillation, Colorimetric Method[2]
5	Formaldehyde	Distillation, Colorimetric Method[1]
6	Free Chlorine	DPD-Ferrous Titrimetric Method[2]
7	Oil and Grease	Liquid-Liquid Partition-Gravimetric Method[3]
8	pH	Electrometric Method[2]
9	Phenols	1) Distillation, Chloroform Extraction Method[2] 2) Distillation, Direct Photometric Method[2]
10	Sulfide	ZnS Precipitation, Iodometric Method[2]
11	Temperature	Laboratory and Field Method[2]
12	Total Dissolved Solids	Dried at 180 °C[2]
13	Total Kjeldahl Nitrogen	Semi-Micro Kjeldahl Method[4]
14	Total Suspended Solids	Dried at 103-105 °C[2]

อากาศเสีย (ปล่องระบาย) จำนวน 7 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Carbon Monoxide	1) Sampling Bag, Non-Dispersive Infrared Method[5] 2) Instrumental Analyzer Method[8]
2	Hydrogen Sulfide	Absorption Sampling, Iodometric Method[5]
3	Opacity	Ringelmann's Method[3,4]
4	Oxide of Nitrogen	1) Absorption Sampling, Phenoldisulfonic Acid Method[6] 2) Instrumental Analyzer Method[9]
5	Sulfur Dioxide	1) Absorption Sampling, Barium-Thorin Titrimetric Method[5] 2) Instrumental Analyzer Method[10]

(นางสาววิชุดา สัมฤทธิ์ผล)
ผู้อำนวยการ
ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก

Sulfuric Acid...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
6	Sulfuric Acid	Isokinetic Sampling, Barium – Thorin Titrimetric Method[6]
7	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method[7]

น้ำใต้ดิน จำนวน 3 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Cyanide	Distillation, Colorimetric Method[2]
2	pH	Electrometric Method[2]
3	Phenols	Distillation, Direct Photometric Method[2]

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9. United States Environmental Protection Agency. **Determination of Oxide of Nitrogen Emissions from Stationary Sources; Instrumental Analyzer Procedure.** 40 CFR 60, Appendix A Method 7E, 2019.

10. United States Environmental Protection Agency. **Determination of Sulfur Dioxide Emissions from Stationary Sources; Instrumental Analyzer Procedure.** 40 CFR 60, Appendix A Method 6C, 2017.

(นางสาววิชุดา สัมฤทธิ์ผล)
ผู้อำนวยการ
ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก

สำเนา

ที่ อก ๐๓๒๐/ ๖๐๕๓

กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๒๕ มีค. ๒๕๖๖

เรื่อง เปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอเปลี่ยนแปลงบุคลากร ของห้องปฏิบัติการวิเคราะห์เอกชน ลงวันที่ ๑๔ มีนาคม ๒๕๖๖

ตามหนังสือที่อ้างถึง บริษัท เอแอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ว-๓๒๓ สถานที่ตั้งเลขที่ ๖๓๖/๓๐ หมู่ที่ ๕ ตำบลแม่น้ำคู้ อำเภอปลวกแดง จังหวัดระยอง ขอเปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์ ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว มีความเห็นดังนี้

ก. ให้ยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๕ ราย

๑) นางสาวเจษฎาพร ศรีบุญเรือง	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๔๑
๒) นางสาวมธุรินทร์ สิงห์เงา	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๔๒
๓) นางสาววนิดา ผลุงจิตต์	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๔๔
๔) นายศุภณัฐ ทิสัยพันธ์	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๖๖
๕) นายสิทธิชัย แก้วเกตุ	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๗๗

ข. ให้เพิ่มเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๑๒ ราย

๑) นายณัฐพงษ์ เพ็งชาวน"	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๐๓
๒) นางสาวกัลยพรรศน์ รัตดี	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๐๒
๓) นางสาวจุฑารัตน์ สีทองหลาง	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๐๓
๔) นางสาวจิตสุภา ประเทืองสุข	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๐๔
๕) นายสรรเสริญ คุ่ยยกสุย	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๐๕
๖) นายณัฐวุฒิ ยมพรมราช	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๐๖
๗) นายจิตกร สีวะสา	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๐๗
๘) นายสิทปวิชญ์ สุวรรณรัตน์	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๐๘
๙) นายสิทธิพันธ์ เสนาชิว	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๐๙
๑๐) นายอนุเจศน์ เลมา	ทะเบียนเลขที่ ว ๓๒๓ จ ๐๐๑๐
๑๑) นายสุรวิทย์ นราพงษ์	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๑๑
๑๒) นายอดิศักดิ์ ตะริศูนย์	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๑๒

อนึ่ง...

อนึ่ง หนังสือฉบับนี้จะหมดอายุพร้อมหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ที่ อก ๐๓๒๐(๓)/๖๔๗๐ ลงวันที่ ๒๔ มิถุนายน ๒๕๖๔ คือในวันที่ ๒๔ มิถุนายน ๒๕๖๗ ทั้งนี้ สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์ได้ที่หน้าเว็บไซต์กรมโรงงานอุตสาหกรรมตาม QR Code ท้ายหนังสือนี้

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายทรี อำพาพันธ์)
ผู้อำนวยการศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก
โทร. ๐ ๓๓๓๓ ๖๐๕๙ ต่อ ๕๐๐๓-๒
ไปรษณีย์อิเล็กทรอนิกส์ eirw@diw.mail.go.th

ขั้นตอนผ่านระบบยื่นคำขอทางอิเล็กทรอนิกส์

Green Industry "อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"



ที่ อก ๐๓๒๐/๒๕๖๓

กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๑๐ พ.ย. ๒๕๖๗

เรื่อง เปลี่ยนแปลงสารมลพิษของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอเปลี่ยนแปลงสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน ลงวันที่ ๒๕ ตุลาคม ๒๕๖๖

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือเปลี่ยนแปลงสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน บริษัท เอแอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำนวน ๑ แผ่น

ตามหนังสือที่อ้างถึง บริษัท เอแอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ว-๓๒๓ สถานที่ตั้งเลขที่ ๖๓๖/๓๐ หมู่ที่ ๕ ตำบลแม่น้ำคู้ อำเภอปลวกแดง จังหวัดระยอง ขอเปลี่ยนแปลงสารมลพิษของห้องปฏิบัติการวิเคราะห์ ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอแอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เพิ่มขอบข่ายสารมลพิษที่วิเคราะห์ในน้ำเสีย จำนวน ๑๓ รายการ และน้ำใต้ดิน ๓ รายการ ตามสิ่งที่ส่งมาด้วย

อนึ่ง หนังสือฉบับนี้จะหมดอายุพร้อมหนังสือต่ออายุรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชนที่ อก ๐๓๒๐(๓)/๖๔๗๐ ลงวันที่ ๒๔ มิถุนายน ๒๕๖๔ คือในวันที่ ๒๔ มิถุนายน ๒๕๖๗ ทั้งนี้ สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์ได้ที่หน้าเว็บไซต์กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายทรี อำพาพันธ์)
ผู้อำนวยการศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก
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ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก
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เอกสารแนบท้ายหนังสือเปลี่ยนแปลงสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท เอแอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ว-๓๒๓
ที่ อก ๐๓๒๐/๒๕๖๓ ลงวันที่ ๑๐ พ.ย. ๒๕๖๗

ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๑๖ รายการ

น้ำเสีย จำนวน 13 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Biochemical Oxygen Demand	1) 5-Day BOD Test, Membrane Electrode Method
		2) 5-Day BOD Test, Azide Modification Method
2	Chemical Oxygen Demand	1) Open Reflux, Titrimetric Method
		2) Closed Reflux, Colorimetric Method
		3) Closed Reflux, Titrimetric Method
3	Color	ADMI Weighted-Ordinate Spectrophotometric Method
4	Cyanide	Distillation, Colorimetric Method
5	Free Chlorine	DPD Ferrous Titrimetric Method
6	Oil and Grease	Liquid-Liquid, Partition-Gravimetric Method
7	pH	Electrometric Method
8	Phenols	1) Distillation, Chloroform Extraction Method
		2) Distillation, Direct Photometric Method
9	Sulfide	ZnS Precipitation, Iodometric Method
10	Temperature	Field Method
11	Total Dissolved Solids	Dried at 180 °C
12	Total Kjeldahl Nitrogen	Semi-Macro Kjeldahl Method
13	Total Suspended Solids	Dried at 103-105 °C

น้ำใต้ดิน จำนวน 3 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Cyanide	Distillation, Colorimetric Method
2	pH	Electrometric Method
3	Phenols	Distillation, Direct Photometric Method

เอกสารอ้างอิง

APHA, AWWA, WEF. Standard Methods for the Examination of Water and Wastewater. 24th ed. Washington, DC : APHA, 2023

right solutions.
right partner.

บริษัท เอแอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด (สำนักงานใหญ่)

104 ซอยพัฒนาการ 40 ถนนพัฒนาการ

แขวงพัฒนาการ เขตสวนหลวง กรุงเทพฯ 10250



ติดต่อเรา